

Heliotropium of Turkey - some flora descriptions

Updated : 2026.01.15

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- **Latest versions:** [archive.org](#) or [academia.edu](#)
- **This is a companion document** to the visual Heliotropium guide for Antalya region and Turkey generally, which can be found at [archive.org](#) and (to come:) [academia.edu](#)

Info: Original description with minor modifications. **Added:** some blue field titles added or trivially adjusted from text without impacting it, but most just the text with colon added; **shortening:** synonymy sometimes shortened or skipped; authors may be skipped on herbarium specimens, non-Turkish national geographic usually skipped; **unchanged:** the text itself is unchanged; **adjustments:** except Syria-Palestine Post 1932 will have the metre measurements converted to mm or cm, and texts that use commas for a decimal may have it changed to a dot; **checks:** the numbers and measurements are always specifically checked; when the original text was English and OCR'd with the OCR looking accurate the words may have slight typos because they were not specifically checked (normal OCR doesn't improve the text and the line ends line up like a page so checking can be more focussed), when English but AI-OCR'd or a poor OCR the text was also fully checked (AI can alter things and removes line ends); when non-English the text was fully checked, and AI asked to spot further OCR errors, then translated usually by Claude, and quoted verbatim, with occasional manual word improvements. With AI transcription a comparison is often done with the OCR if it was decent, using winmerge.

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Measurement Systems

This is mostly derived from a discussion with Gemini and therefore in need of checking.
Botanists in the past used a variety of foot-inch-line measurements, with the English inch divided

into 16 lines now the international one (becoming defined exactly in 1950s and 1960s as 25.4). British botanists often used a line to mean 1/12 of an inch, not 1/16th.

Etymologically the English inch (and ounce) comes from latin uncia (one-twelfth), the Paris and other language forms come from the word for thumb (pouce, poll., pollex, pollicares etc).

Measurements tabularised (Paris/English read from Wikipedia); there was also the older Roman Inch (divided into 12) -

	Paris	English	Russian	Vienna	Prussian	Metric
Foot cm	32.48	30.48			31.385	
Inch mm	27.07	25.4	25.4	26.3		
Line (1/12) mm	2.256	2.117				
Line (1/16) mm		1.588		2.19		
Line (1/10)			2.54		3.14	
Authors	Linnaeus, Bunge, Boissier	1/12: Hooker, Wight, Flora Capensis (Harvey and Sonder)		Endlicher (for Austrian local floras & some earlier works)		Post, Davis, Muschler

Linnaeus used the Paris standard and till mid-C19 many British botanists still used it particularly the 'globalists' - those writing in Latin, those using Continental herbaria and authors of Universal Floras.

British botanists writing national British flora tended to use English inches with a line meaning 1/12.

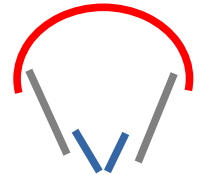
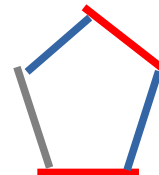
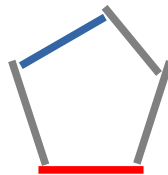
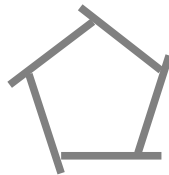
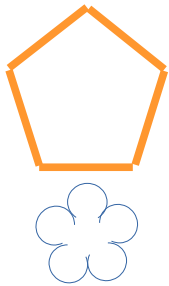
Russian botanists writing national Russian flora & government funded ones tended to use English inches with a line meaning 1/10, but those more global used the Parisian standard.

Immature Flowers

Generally speaking, petals and sepals can be configured in various ways. For *Heliotropium*, we're interested in whether the flowers are overlapping (2-4) or not (1, with curled-in (involute) margins).

- **Individual** petals/sepals - **margins** can curve or roll in (**involute**) or out (**revolute**); **tips** may converge in to a point without fusing (**connivent**); **bases** may fuse in a seam (**connate**).
- **Groups** of immature petals/sepals can overlap in several ways, here the overlapping quality is indicated as fully **overlapping** (red), fully **underlapping** (blue), or **mixed** with one margin over and one side under the adjoining petal (grey) -

Valvate	Convolute, Twisted, Contorted	Imbricate, Cochlear	Quincuncial	Vexillary
Petals touch at margins without overlapping e.g. Rose sepals (beneath, Valvate-Involute the petals curl in and touch off-margin)	All mixed, identically overlapping the next and underlapping the prior, creating a fully spiral look	mixed except 1 overlaps , opposite underlaps , generally the overlaps and underlaps will be clearest to see	alternates full overlap and full underlap except 1 mixed	1 large (vexillum , standard , banner) overlaps 2 mixeds (wings), which overlap 2 innermost keel petals (often joined in a 'V') e.g. pea flower



- When the petal closest to the stem (posterior petal) is fully **overlapping** (often the largest) it is termed "Descending", but when fully **underlapped** (often the smallest) it is "Ascending".
- Petal size differences may reflect growth order rather than final mature size.

iNaturalist posts for the following 6 taxa are at https://www.inaturalist.org/observations?place_id=7183&taxon_ids=717186,1653202,769987,770046,770162,770026

key

Flora of Turkey 1978

1b. Annual, hairy

2b. Calyx persistent, not enclosing nutlets; nutlets 4

3b. Bracts absent

4a. Small teeth or intercalary lobes present between primary corolla lobes

5a. Anthers inserted near base of corolla tube, tips hooked -- 1. **circinatum**

5b. Anthers inserted just below middle of corolla tube, tips not hooked -- 2.

ferrugineogriseum

4b. Teeth or intercalary lobes lacking between primary corolla lobes

6a. Corolla lobes involute in bud, not overlapping

7a. Corolla 8-13 mm; leaves green -- 3. **greuteri**

7b. Corolla 3-6 mm; leaves greyish-tomentose

8a. Nutlets indistinctly warty to rugulose, with short retrorse hairs; corolla 5-6 mm -- 4. [haussknechtii](#)

8b. Nutlets tuberculate, glabrous; corolla 3-3.5 mm -- 5. [bovei](#)

6b. Corolla lobes imbricate in bud, overlapping...

Flora of Armenia 1980

1a. Of the 4 carpels of the ovary, only 1 forms a mericarp 4-5 mm long, to which three underdeveloped carpels are adnate. Calyx 2 mm long, at fruit 4-5 mm long, gamosepalous, with 5 small obtuse teeth, deciduous together with the fruit. Leaves densely white-pilose on both surfaces. Stems prostrate, 20-60 cm long, branched from the base -- 7. H. [supinum](#) L.

1b. Mericarps 4, calyx 5-partite, persistent or deciduous separately from the mericarps. Leaves more or less green above. Plants erect -- 2

2a. Stigma together with the upper part of the style shortly conical, capitate, lower part of the style very short. Anthers reaching the middle of the tube with their apices. Corolla exceeding the calyx 2 times, with a densely pubescent tube 4-5 mm long externally and a flat cup-shaped limb 4-5 mm in diameter. Lobes of the limb oblong or ovate, without intermediate teeth. Sepals linear. Mericarps finely pubescent, foveolate, low-conical. Leaves and stem shortly velvety-pubescent -- 6. H. [suaveolens](#) Bieb.

2b. Upper part of the style elongate-conical or subulate -- 3

3a. Corolla 7-8 mm long, externally densely puberulent-villous, narrowly tubular, with a poorly expressed limb; lobes about 1 mm long, oblong, with intermediate linear more or less obtuse teeth. Calyx 2-3 times shorter than the corolla, enlarging in fruit, with narrowly linear acute segments. Inflorescences long, erect, lax. Upper part of the style conical, pilose, 1.5 mm long. Mericarps glabrous, smooth, oblong, acuminate, 1.5 mm long -- 5. H. [tzvelevii](#) T. N. Pop.

3b. Corolla smaller, with a distinctly expressed limb, calyx not more than 1.5-2 times shorter than the corolla. Mericarps ovoid -- 4

4a. Upper part of the style subulate-filiform, elongate, apex bifid, not pubescent. Mericarps with more or less expressed sculpture. Leaves yellowish-green, oblong -- 1. H. [europaeum](#) L.

4b. Upper part of the style elongate-conical, not bifid, often weakly pilose -- 5

5a. Mericarps densely pubescent, entire plant appressed velvety-pubescent. Sepals spreading-pilose, curved upward. Leaves obovate, rounded at the apex -- 4. H. [lasiocarpum](#) Fisch. et C. A. Mey.

5b. Mericarps glabrous -- 6

6a. Mericarps smooth or weakly reticulate-rugose, 1.5 mm long. Calyx teeth stellately spreading in fruit -- 3. H. [ellipticum](#) Ledeb.

6b. Mericarps coarsely tuberculate, about 2 mm long. Calyx teeth long spreading-pilose, more or less curved upward in fruit, but sometimes also stellately spreading -- 2. H. [dolosum](#) De Not.

(Claude 2026.01.15)

1а. Из 4 долей завязи только 1 образует эрем 4-5 мм дл., к которому прирастают три недоразвитые доли завязи. Чашечка 2 мм дл., при плоде 4-5 мм дл., сросстнолистная, с 5 маленькими туповатыми зубцами, опадает вместе с плодом. Листья с обеих сторон густо беловолосистые. Стебли лежачие, 20-60 см дл., от основания ветвистые -- 7. H. *supinum* L.

1б. Эремов 4, чашечка 5-раздельная, остающаяся или опадающая отдельно от эремов. Листья сверху б. или м. зеленые. Растения

прямостоячие -- 2

2a. Рыльце вместе с верхней частью столбика короткоконическое, шляпковидное, нижняя часть столбика очень короткая. Пыльники достигают середины трубки своими верхушками. Венчик превосходит чашечку в 2 раза, с густо опушенной снаружи трубкой 4-5 мм дл. и плоским чашевидным отгибом 4-5 мм в диам. Лопасті отгиба продолговатые или яйцевидные, промежуточных зубцов нет. Чашелистики линейные. Эремы тонко опушенные, ямчатые, низкокони́ческие. Листья и стебель коротко бархатисто опушенные -- 6. *H. suaveolens* Bieb.

2b. Верхняя часть столбика удлинённо-коническая или шиловидная -- 3

3a. Венчик 7-8 мм дл., снаружи густо пушисто-мохнатый, узкотрубчатый, с плохо выраженным отгибом; лопасті около 1 мм дл., продолговатые, с промежуточными линейными б. или м. притупленными зубцами. Чашечка в 2-3 раза короче венчика, при плодах увеличивающаяся, с узколинейными острыми долями. Соцветия длинные, прямостоячие, рыхлые. Верхняя часть столбика коническая, пушистая, 1,5 мм дл. Эремы голые, гладкие, продолговатые, заостренные, 1,5 мм дл. -- 5. *H. tzvelevii* T. N. Pop.

3b. Венчик менее крупный, с явственно выраженным отгибом, чашечка не более чем в 1,5-2 раза короче венчика. Эремы яйцевидные -- 4

4a. Верхняя часть столбика шиловидно-нитевидная, удлинённая, верхушка раздвоенная, не опушенная. Эремы с б. или м. выраженной скульптурой. Листья желтовато-зелёные, продолговатые -- 1. *H. eugoraeum* L.

4b. Верхняя часть столбика удлинённо-коническая, нераздвоенная, часто слабоволосистая -- 5

5a. Эремы густо опушенные, все растение прижато бархатисто опушённое. Чашелистики оттопыренно-волосистые, кверху загнутые. Листья обратнойяйцевидные, на верхушке закругленные -- 4. *H. lasiocarpum* Fisch. et C. A. Mey.

5b. Эремы голые -- 6

6a. Эремы гладкие или слабо сетчато-морщинистые, 1,5 мм дл. Зубцы чашечки при плодах звездчато растопыренные -- 3. *H. ellipticum* Ledeb.

6b. Эремы грубобугорчатые, около 2 мм дл. Зубцы чашечки длинно оттопыренно-волосистые, при плодах б. или м. вверх загнутые, но бывают и звездчато растопыренными -- 2. *H. dolosum* De Not.

Transcription: Gemini+OCR, winmerge compared

Bunge 1869

Section VI. *Bucanion* Sczegl. l. c. p. 328.

Genus *Bucanion* Stev. l. c. p. 568. *Catimas* Alph. DC. in part no. 1. *Cathimas* Bge. Rel. Lehm. p. 222. *Odontotropium* Griseb. l. c. in part.

Annual herbs. **Spikes** without bracts, uniseriate, secund. **Calyces** subsessile, unchanged, persistent. **Corolla limb** subcampanulate-infundibuliform, 5-lobed or 5-cleft, segments with margins induplicate, converging subvalvately, obtuse, acute or acuminate, then sometimes circinately involute; **throat** glabrous. **Anthers** inserted at base, often with hooked appendages. **Style** short or nearly absent, **stigma** conical or conical-subulate, often bilobed. **Nutlets** glabrous, small, rarely minutely hispidulous.

Diagnostic key to species.

1a. Corolla limb 5-lobed or 5-parted, intercalary segments absent 2.

1b. Corolla limb 5-cleft, intercalary segments 5, tooth-shaped, ovate or subulate 10 [neglectum, mesinatum, samoliflorum, kotschyanum].

2a. Corolla segments obtuse or acute, apex straight 3.

2b. Corolla segments acuminate-subulate, incurved or circinately involute 9 [bovei, circinnatum].

3a. Corolla segments very obtuse, rounded 4.

3b. Corolla segments acute or somewhat acute 7.

4a. Limb broadly campanulate-infundibuliform, very shortly 5-lobed, 3 times longer than tube, leaves above glabrescent, anthers with hooked apiculus, nutlets very smooth, glabrous. *H. Szovitsii*.

4b. Limb infundibuliform, divided nearly to middle, leaves above softly pubescent [5](#).

5a. Calyx much shorter than corolla tube, style conspicuous, nutlets glabrous [6](#).

5b. Calyx exceeding corolla tube, stigma subsessile, nutlets velvety-hispid. H. [smyrnaeum](#). [PoWo FOT →[bovei](#)]

6a. Corolla limb infundibuliform, leaves with rounded base, spreading-villous. H. [mamanense](#). [PoWo species, Iranica 1994 →[bovei](#)].

6b. Corolla limb campanulate, leaves with cuneate-attenuate base, appressed-subsericeous. H. [teheranicum](#). [PoWo species, Iranica 1966 & 1994 →[bovei](#)]

7a. Anthers with hooked appendages, nutlets glabrous [8](#).

7b. Anthers with straight apex, nutlets hispid, calyx exceeding corolla tube, segments of 5-cleft limb very acute. H. [Hausknechti](#).

8a. Calyx shorter than corolla tube, throat elongate-infundibuliform, limb 5-lobed, anthers remote from limb. H. [grandiflorum](#) [H. [greuteri](#)].

8b. Calyx exceeding corolla tube, throat short, limb 5-parted, anthers nearly reaching base of segments. H. [prusianum](#) [PoWo FOT →[bovei](#)].

9a. Calyx much shorter than tube, limb divided to middle, segments subulate-acuminate, circinate, spikes elongate. H. [circinnatum](#) [[circinatum](#)].

9b. Calyx equaling or exceeding tube, limb 5-parted, segments shortly acuminate, incurved, spikes abbreviated. H. [Bovei](#).

10a. Corolla segments acuminate, apex subulate-involute or incurved [11](#).

10b. Corolla segments obtuse or somewhat acute, apex straight [12](#).

11a. Stem simple at base, dichotomous above, calyx exceeding tube, anthers with hooked appendages, spikes short, crowded. H. [neglectum](#) [PoWo FOT →[circinatum](#)].

11b. Stem spike-bearing from base, divaricately branched, calyx shorter than tube, anthers straight, spikes very lax, elongate. H. [mesinatum](#). [PoWo →[mesinatum](#), Iranica 1994 →[dissitiflorum](#)]

12a. Intercalary corolla segments tooth-shaped or ovate [13](#).

12b. Intercalary corolla segments subulate-filiform, nearly equaling limb segments. H. [samoliflorum](#) [PoWo species].

13a. Nutlets muricate-rugose, limb segments erect, intercalary segments tooth-shaped, style very short, glabrous, stem simple at base, branched above, spikes crowded. H. [Kotschyanum](#) [PoWo →[circinatum](#) Griseb., Iranica 1994 →[bovei](#)].

13b. Nutlets very smooth, glabrous, intercalary segments rather large [14](#).

14a. Spikes very smooth, calyx shorter than tube, corolla segments obovate-orbicular, spreading,

glabrous outside, intercalary segments half as small, style conspicuous, backward very hispid. H. [dissitiflorum](#) [PoWo species].

14b. Spikes crowded, calyx exceeding tube, corolla segments very short, ovate, erect, hispid to apex, intercalary segments scarcely smaller, converging, style short, glabrescent. H. [sultanense](#) [PoWo species].

Sectio VI. Bucanion Sczegl. 1. c. p. 328.

Genus Bucanion Stev. l. c. p. 568. Catimas Alph. DC. ex p. n. 1. Cathimas Bge. Rel. Lehm. p. 222. Odontotropium Griseb. 1. c. ex p. Herbae annuae. Spicae ebracteatae uniserialis secundae. Calyces subsessiles immutati persistentes. Corollae limbus subcampanulato-infundibularis 5lobus vel 5fidus, lacinii margine induplicatis subvalvatim conniventibus, obtusis, acutis vel acuminatis tunc interdum circinnatim involutis; faux glabra. Antherae basi insertae, saepe hamato appendiculatae. Stylus brevis vel subnullus, stigma conicum vel conico-subulatum saepe bilobum. Nuculae glabrae parvae, raro minute hispidulae. Clavis specierum diagnostica.

1a. Limbus corollae 5lobus vel 5-partitus, laciniae intercalares nullae [2](#).
1b. Limbus corollae 5fidus, laciniae intercalares 5 dentiformes, ovatae vel subulatae [10](#).

2a. Corollae laciniae obtusae vel acutae apice rectae [3](#).
2b. Corollae laciniae acuminato-subulatae incurvae vel circinnato involutae [9](#).

3a. Corollae laciniae obtusissimae rotundatae [4](#).
3b. Corollae laciniae acutae vel acutiusculae [7](#).

4a. Limbus late campanulato-infundibularis brevissime 5lobus, tubo 3plo longior, folia supra glabriuscula, antherae hamato-apiculatae, nuculae laevissimae glabrae. H. [Szovitsii](#).
4b. Limbus infundibularis fere ad medium divisus, folia supra molliter pubescentia [5](#).

5a. Calyx tubo corollae multo brevior, stylus conspicuus, nuculae glabrae [6](#).
5b. Calyx tubum corollae superans, stigma subsessile, nuculae velutino-hispidae. H. [smyrnaeum](#).

6a. Corollae limbus infundibularis, folia basi rotundata patulo-villosa H. [mamanense](#).
6b. Corollae limbus campanulatus, folia basi cuneato-attenuata adpresse-subsericea H. [teheranicum](#).

7a. Antherae hamato-appendiculatae, nuculae glabrae [8](#).
7b. Antherae apice rectae, nuculae hispidae, calyx corollae tubum superans, limbi 5fidi lac. acutissimae H. [Hausknechti](#).

8a. Calyx tubo corollae brevior, faux elongato infundibularis, limbus 5lobus, antherae a limbo remotae. H. [grandiflorum](#).
8b. Calyx tubum corollae superans, faux brevis, limbus 5partitus, antherae fere basin laciniarum attingentes. H. [prusianum](#).

9a. Calyx tubo multo brevior, limbus ad medium divisus, laciniae subulato-acuminatae circinnatae, spicae elongatae. H. [circinnatum](#).
9b. Calyx tubum aequans vel superans, limbus 5partitus, laciniae breviter acuminatae incurvae, spicae abbreviatae. H. [Bovei](#).

10a. Corollae laciniae acuminatae apice subulato-involutae vel incurvae [11](#).
10b. Corollae laciniae obtusae vel acutiusculae apice rectae [12](#).

11a. Caulis basi simplex superne dichotomus, calyx tubum superans, antherae hamato-appendiculatae spicae breves confertae. H. [neglectum](#).
11b. Caulis a basi spiciger divaricato-ramosus, calyx tubo brevior, antherae rectae, spicae laxissimae elongatae. H. [mesinanum](#).

12a. Corollae laciniae intercalares dentiformes vel ovatae [13](#).
12b. Corollae laciniae interc. subulato-filiformes limbi lacinias subaequantes. H. [samoliflorum](#).

13a. Nuculae muriculato-rugosae, laciniae limbi erectae, intercalares dentiformes, stylus brevissimus glaber, caulis basi simplex superne ramosus, spicae confertae H. [Kotschyanum](#).
13b. Nuculae laevissimae glabrae, laciniae intercalares majusculae [14](#).

14a. Spicae laevissimae, calyx tubo brevior, cor. laciniae obovato-orbiculares patulae extus glabrae, intercalares dimidio minores, stylus conspicuus retrorsum hispidissimus. H. [dissitiflorum](#).
14b. Spicae confertae, calyx tubum superans, cor. laciniae brevissimae ovatae erectae ad apicem usque hispidae, intercalares vix minores conniventes, stylus brevis glabriusculus H. [sultanense](#).

Transcription: Gemini & OCR, compared with winmerge using original scan, read selectively

bovei

[PoWo](#): [Native](#): Iraq, Lebanon-Syria, Palestine, Sinai, Türkiye. [Intro](#): Germany

[mamanense](#) - PoWo has as separate species; Iranica 1994 maps to bovei.

[kotschyanum](#) - PoWo maps to H. circinatum Griseb., Iranica 1994 maps to bovei Boiss.

Flora of Turkey 1978

H. bovei Boiss, Diagn ser 1(11).87 (1849). Syn: H. smyrnaeum Bunge in Bull. Soc. Nat. Mosc 42.311 (1869); H. prusianum Bunge, op. cit 310 (1869); H. kotschyanum Bunge, op cit. 312 (1869). Figure 11, p 249.

Plant: Annual, greyish-tomentose with soft hairs.

Stems: erect or prostrate, branched.

Leaves: 8-25 mm, ovate-mucronulate, petiolate to subsessile.

Inflorescence: to 20 cm, lax.

Calyx: sessile, 2.3(-3) mm, deciduous; lobes linear-lanceolate, acute.

Corolla: 3-3.5 mm, cylindrical, pubescent, **limb** minute, erect, **lobes** triangular-acuminate [key:] **involute** in bud, not overlapping.

Stigma: subsessile, subulate-conical from a disc-like base, undivided, pubescent at tip.

Nutlets: glabrous, tuberculate.

Fl.: 6-7. Vineyards, fields, road-sides, 200-650 m.

Syria-Palestine Post 1933

H. Bovei Boiss. (1849)

Key Section: **Annuals** - **Corolla**-lobes more or less valvate, connivent in bud, straight or curved - **Limb** of corolla 5-lobed.

Plant: ☉ [Annual] (iv. 136). - 30 to 50 cm, appressed-canescens.

Leaves: petioled, ovate to elliptical, obtuse, lineate at upper surface, prominently nerved below.

Racemes: long, loose;

Corolla: glabrous within, 3 to 4 mm long, limb as long as tube, with or without **teeth in sinuses**;

Anthers: inserted below middle of tube, but reaching to its throat, with inflexed tip;

Stigma: nearly sessile, long-tapering, hispid above;

nutlets: hispidulous or glabrous, tubercled.

Fl.: May-Sept. Fields.

Iranica 1994

6. *Heliotropium bovei* Boiss., *Diagn. pi. orient.* 11: 87. 1849. Holotype: in Arabia felici, 1839, Bove (G-BOIS!; photo Hb. Akhani!; Isotype: P). [According to BOISSIER 1875 the type locality is in Syria). = *H. mamamense* [= *mamanense*] Bunge, *Bull. Soc. Imp. Naturalistes Moscou* 42: 308. 1869. Lectotype (hoc loco designatus): Ad salinas Maman Persiae boreali-occidentalis, Seidlitz s.n. (P! [cum diagn.]; Isotypes: G-BOIS!, LE!, P!). = *H. teheranicum* Bunge, *Bull. Soc. Imp. Naturalistes Moscou* 42: 309. 1869. Lectotype (hoc. loco designatus): In apricis siccis pr. Sergendeh [Zargandeh] in vicinitate urbis Teheran, 27.5.1859, Bunge & Bienert (P!; Isotype: G-BOIS!). [2 little pieces without locality and date are in Herb. Bunge LE!] = *H. kotschyianum* Bunge, *Bull. Soc. Imp. Naturalistes Moscou* 42: 312. 1869. Holotype: in Tauri cilicici alpibus Butgar-dagh, 24.8.1853, Kotschy it. cil. 277 (P!; fragm.).2)

Plant: Annual, 10-50 cm high, branched from base, greyish, **indument** whitish-villose of patent or subappressed hairs.

Leaves: 1-3.5 cm long, 0.5-2.5 cm broad, ovate, elliptic to suborbicular, with **petiole** up to 2.5 cm, sometimes subsessile, at top obtuse to subacute, at margin somewhat thickened, attenuate or rounded at base;

upper side: appressed-villose, nerves slightly impressed;

lower side: patent-villose, nerves prominent.

Inflorescence: terminal or lateral, rarely branched.

Cymes: elongate, up to 35 cm, with 10-100 **flowers**, unilateral and uniseriate.

Flowers: usually without pedicel, lower ones sometimes shortly pedicelled up to 1 mm.

Calyx: easily dropping together with nutlets;

calyx lobes: 2.5-3.5 mm long, 0.5-1 mm broad, lanceolate-oblong, nearly free to base, acute.

Corolla: 4.5-9 mm long, infundibular; tube 2-4 mm;

lobes: 1-2.5 mm long, 0.5-2.5 mm broad, ovate-triangular, subacute.

Anthers: 1.8-3 mm long, apex beaked, recurved apiculate, inserted 0.9-1.2 mm above corolla base.

Stigma: 1.5-2 mm long, elongate-conical, above middle pilose.

Style: only 0.1-0.3 mm long, often hidden by stigma, glabrous.

Nutlets: ellipsoide^[sic], 1.3-2 mm long, 1-2.5 mm broad, rugose, sparsely pilose.

General distribution: Palestine, Syria, Lebanon, Turkey, Iraq, Iran.

Note: Although *H. bovei* has been reported from Iran (Rechinger 1948) it was not mentioned in *Flora Iranica* (RIEDL 1967). All Iranian material of this species was generally put under *H. mamamense* [=mamanense] there. The authors have studied much material of *H. bovei* from Turkey and Iraq, but were not able to find any differences to separate it from *H. mamamense* because *H. bovei* is a very polymorphic species relative to corolla length and shape. Usually the corolla has no intercalary teeth, but in some specimens there are flowers with short intercalary lobes found. Ecologically this species grows under very different soil conditions, e.g. saline, sandy and calcareous soils, gypsum, rocky slopes and as weed in arable land and wastelands.

(In text) *H. bovei* is a very polymorphic species, but its beaked **anthers** are always very specific.

Note: There is only a fragment of a specimen under *H. kotschyannum* in the BUNGE herbarium at Paris without declaration of any locality. BUNGE himself mentions Kotschy 277 as type, but all examined specimens of the KOTSCHY exsiccatum distributed with the remark "263 cum 277 mixtum" belong to *H. suaveolens*.

Flora Iranica 1966

47. *H. mamamense* [=mamanense] Bge., Bull. Soc. Nat. Mosc. 42/2: 308 (1869). - Tab. 11, fig. 4. Syn.: *H. teheranicum* BGE., 1. c. 309. Typus: Persia boreali-occid.: Ad salinas Maman, SEIDLITZ, P!

Indumentum: whitish-tomentose or somewhat villous, especially on the leaves more closely pressed.

Stem: more or less erect, either branched from the base or only in the upper part.

Leaves: all rather long-petiolate, blade up to 28(30) mm long, to 20 mm wide, ovate or ovate-oblong, base rounded- or obliquely cuneate, apex obtuse or somewhat acute, nerves slightly impressed above, prominent beneath.

Inflorescences: single or more rarely paired, elongated, lax.

Calyces: sessile, 3-4 mm long, with 5 lanceolate, acute, white-villous lobes, deciduous together with the nutlets.

Corolla: about twice as long as the calyx, 4.5-6 mm long, tube cylindrical pubescent outside glabrous inside, limb erect-spreading four times shorter than the tube, lobes triangular-ovate acute at first inflexed in the tube, margin plicate-involute.

Anthers: situated below the middle of the tube, linear apiculate, with the apiculus incurved.

Stigma: subsessile, from a disciform base long-subulate, rather long-hispidulous.

Nutlets: brown, ovate-rounded, very indistinctly reticulate-rugose or nearly smooth, glabrous.

Distr. gen.: Iraq, Kurdistan, Persia.

Note: The differences that Bunge cites for *H. teheranicum* appear hardly sufficient to distinguish it as a separate species, given the extraordinary variability of the affected characteristics (indumentum, corolla size, anther tips). Upon examination of abundant material, these differences largely disappear.

Indumentum albido-tomentosum vel subvillosum, imprimis in foliis appressiusculum. Caulis +- erectus, aut a basi aut parte superiore tantum ramosus. Folia omnia longiuscule petiolata, lamina usque ad 28(30) mm longa, ad 20 mm lata, ovata vel ovato-oblonga, basi rotundato- vel oblique cuneata, apice obtusa vel acutiuscula, nervis supra paulo impressis, subtus prominentibus. Inflorescentiae singulae vel rarius binae, elongatae, laxae. Calyces sessiles, 3-4 mm longi, laciniis 5 lanceolatis, acutis, albo-villosis, cum nuculis decidui. Corolla calyce subduplo longior, 4,5-6 mm longa, tubo cylindraceo extra pubescente intus glabro, limbo erecto-patente tubo quadruplo brevior, lobis triangulari-ovatis acutis primo in tubo inflexis, margine plicato-involutis. Antherae infra medium tubum sitae, lineares apiculatae, apiculo incurvato.

Stigma subsessile, e basi disciformi longe subulatum, longiuscule hispidulum. Nuculae brunneae, ovato-rotundatae, valde obsolete reticulato-rugosae vel sublaeves, glabrae. Distr. gen.: Iraq, Kurdistan, Persia. Die Unterschiede, die BUNGE für *H. teheranicum* anführt, erscheinen in Anbetracht der außerordentlichen Variabilität der betroffenen Merkmale (Indument, Korollgröße, Spitzen der Antheren) kaum hinreichend zur Unterscheidung einer eigenen Art. Bei Untersuchung reichlichen Materials verwischen sie sich weitgehend.

Flore du Liban et de Syrie 1930

Google: **Plant** covered with very appressed white **hairs**; **stigma** conical, long attenuated, hairy towards the apex; **anthers** reaching the throat of the corolla. ① [Annual]. Coast, Coele-Syria, Aintab. Cultivated fields. Summer.

Pl. couverte de poils blancs très appliqués; stigm. conique, longuement atténué, poilu vers le sommet; anthères atteignant la gorge de la cor. ①. Littoral, Cœlésyrie, Aintab. Champs cultivés. Été.

Boissier Diagnoses 1849

Plant: H. Annual, entirely covered with dense soft greyish velvety **pubescence**, with branched prostrate(?) **stems**; **leaves** ovate, minutely pointed, subsessile, lined above, with prominent nerves beneath;

spikes abbreviated, with sessile somewhat distant **flowers**,

calyx divisions lanceolate-linear, rather acute,

corolla small, tubular, appressed-pubescent externally, glabrous internally, with **tube** somewhat shorter than **calyx**, **limb** minute, erect, with triangular-lanceolate acuminate **lobes**, margins inrolled above, converging in bud, terminated by a recurved point,

stigma subsessile, from a discoid base subulate-conical, undivided, pubescent above,

nutlets ovate-rounded, glabrous, tuberculate.

Habitat: in Arabia Felix. (Bove.)

Leaves 4-5 lines [9-11.3 mm] long, **flowers** somewhat distant, **corolla** scarcely a line and a half long [3.4 mm].

Note: Allied in habit and indumentum to *H. rotundifolium* which differs by perennial root, larger flowers, pubescent smooth nutlets, awnless anthers, corolla tube somewhat exceeding the calyx, etc. - The aestivation of the corolla between the sections *Catimas* and *Euheliotropium* appears to me to arise from variation in the width and inrolling of the calyx lobes; if the lobes are broad and obtuse then they are flat and quincuncial in aestivation, if narrow and acute then they appear convolute at the margin, incurved at apex and converging in aestivation, but even in these if you examine correctly you will recognize from a certain irregularity a quincuncial rather than valvate arrangement.

*H. annum totum pube molli densa velutinum griseum, caulibus ramosis prostratis ? foliis ovatis mucronulatis subsessilibus superne lineatis subtus prominenti-nervosis, spicis abbreviatis, floribus sessilibus remotiusculis, calycis partitionibus lanceolato-linearibus acutiusculis, corollae parvae tubulosae extus adpressè pubescentis intus glabrae tubo calyce subbreviori limbi minuti erecti laciniis triangulari-lanceolatis acuminatis margine superne convolutis in praefloratione conniventibus mucrone recurvo terminatis, stigmate subsessili e basi disciformi subulato-conico indiviso superne pubescenti, nuculis ovato-rotundis glabris tuberculatis. Hab. in Arabia felici. (Bove.) Folia 4-5 lin. longa, flores remotiusculi, corolla vix sesquilineam longa. Affine habitu et indumento *H. rotundifolio* quod differi radice perenni, floribus majoribus, nuculis pubescentibus laevibus, antheris muticis, tubo corollino calycem subsuperanti etc. - AEstivatio corollae inter sectiones *Catimas* et *Euheliotropium* mihi ex variatione latitudinis et convolutionis laciniarum calycis orta videtur; si lacinae latae et obtusae sunt tunc planae et aestivatione quincunciales, si angustae et acutae tunc margine convolutae apice incurvae et aestivatione conniventes videntur, sed etiam in eis si rectè spectes ex quadam irregularitate dispositionem quincuncialem potius quam valvarem dignosces.*

Bunge 1869

pdf366 (p312)

32. *Heliotropium Bovei* Boiss. l. c. p. 87!

Hab. in Arabia felici (Bove!) v. fragments from amic. Boissier benevole comm.

I doubt whether a plant collected by Blanche in Syria belongs here, of which he communicated to me small fragments under the name *H. Bovei* through Spach, for the **nutlets** in this are minute and minutely pubescent, not glabrous as indicated in the cited diagnosis, and the **spikes** rather long; nevertheless the fragments of both forms which are available to me are too incomplete for

anything certain to be determined. [Claude]

32. *Heliotropium Bovei* Boiss. l. c. p. 87! Hab. in Arabia felici (Bove!) v. fragmenta ab amic. Boissier benevole comm. Dubius haereo an huc spectet planta a cl. Blanche in Syria collecta, cujus frustula sub nomine *H. Bovei* mihi communicavit cl. Spach, nam nuculae in hac minutae puberulae, nec glabrae, ut indicantur in diagnosi citata, & spicae longiusculae, attamen fragmenta utriusque formae, quae mihi praesto sunt, nimis manca, ut certi quid erui possit.

34. *Heliotropium Kotschyanum* n. sp.

[PoWo maps to *H. circinatum* Griseb., Iranica 1994 maps to *bovei*]

Plant: *H.* annual, erect, above divaricately long-branched, canescent; with

leaves petiolate ovate-subrotund obtuse,

spikes solitary finally rather loose elongate uniseriate, with

fruiting calyces distant, the **lobes** oblong-linear rather obtuse exceeding the **tube** of the **corolla** clothed with minute upwardly directed **pubescence** glabrous within, the **lobes** of the funnel-shaped plicate **limb** erect-spreading shorter than the **tube** ovate with apex rounded very obtuse pubescent on the back to the middle, the **intercalary lobes** tooth-like very minute,

with **anthers** inserted above the base hooked-apiculate reaching the throat,

with **stigma** subsessile from a dilated base conically attenuate hispid from the middle much exceeding the glabrous **style**,

with **nutlets** verruculose glabrous.

It occurs in the alps of the Cilician Taurus at Butgar-dagh. (Kotschy Cilician journey no. 277!) I have seen specimens in flower and fruit in the herbarium of the St. Petersburg Academy under the name *H. rotundifolium*. The habit is almost that of *H. smyrnaeum*, from which it differs, among other things, by the **intercalary lobes** of the corolla and the glabrous **nutlets**. [Claude]

34. *Heliotropium Kotschyanum* n. sp. *H.* annuum, erectum, superne divaricato-longeramosum, canescens; foliis petiolatis ovato-subrotundis obtusis, spicis solitariis denique laxiusculis elongatis uniseriatis, calycibus fructiferis distantibus, laciniis oblongo-linearibus obtusiusculis corollae tubum pube sursum versa minuta vestitum intus glabrum superantibus, limbi infundibularis plicati laciniis erecto-patulis tubo brevioribus ovatis apice rotundatis obtusissimis dorso ad medium puberulis, laciniis intercalaribus dentiformibus minutissimis, antheris supra basin insertis hamato-apiculatis faucem attingentibus, stigmatibus subsessilibus e basi dilatata conico - attenuato a medio hispido stylum glabrum multo superante, nuculis verruculosis glabris. Hab. in Tauri cilicici alpebus Butgar-dagh. (Kotschy it. cil. n. 277!) v.s. sp. fl. & fr. in hb. Acad. petrop. sub nom. *H. rotundifoli*. Habitus fere *H. smyrnari*, a quo differt, praeter alia, laciniis corollae intercalaribus & nuculis glabris.

circinatum

PoWo: Iran, Iraq, Türkiye

Flora Iranica 1966 synonymises with *H. Haussknechtii* Bunge

Flora of Turkey 1978

1. *H. circinatum* Griseb., Spic. 2:78 (1844). Syn: *H. neglectum* Bunge in Bull. Soc. Nat. Mose. 42:312 (1869). Ic: Nabélek in Publ. Fac. Sci. Univ. Masaryk Brno 70 17, t. 3 (1926) Figure 11, p. 249.

Plant: Annual herb to 50 cm, greyish to whitish **tomentose**.

Stem: erect, branched.

Leaves: 10-25(50) mm, ovate, obtuse, rarely subacute.

Inflorescences: 1-2, lax, elongate.

Calyx: sessile, 3-3.5 mm, deciduous.

Corolla: 6-8 mm, funnel-shaped, **secondary lobes** subulate-filiform, slightly shorter than primary lobes, introflexed.

Anthers: inserted near base of corolla tube, **tips** hooked.

Stigma: subsessile, cylindrical-subulate from a disc-like base.

Nutlets: glabrous, smooth.

Fl.: 4-8. Ruderal; gravelly and rocky slopes, shingle of streambeds, 400-1500 m.

Geo: A8 B6-B8 C4-C8 ... N. Iraq, N. Iran. Ir.-Tur. element.

Note: Related to *H. ferrugineogriseum*.

Iranica 1994

11. *Heliotropium circinatum* Griseb., Spic. fl. rumel.: 78. 1844. Type: in Anatolia orientali, Donietti (non vidi). Fig.: Davis, Fl. Turkey 6: 249, fig. 11, 1.

Plant: Annual, 15-40 cm high, not or slightly branched from base, divaricately branched especially in upper parts and inflorescence, **indument** whitish villose, subappressed, mixed with long patent hairs up to 1.5 mm long.

Leaves: 1.6-5 cm long, 1-2.5 mm broad, ovate, elliptic-ovate, usually with **petiole** of ca. 0.5-3 cm, small or upper leaves sessile, subacute to obtuse at top, rotundate, truncate or rarely subcordate at base, **margin** slightly thickened; upper side subappressed villose to subtomentose; lower side patent villose to tomentose.

Inflorescence: lateral and terminal, **terminal ones** with two branches;

cymes: 2-20 cm long with up to 70 **flowers**, uniseriate, unilateral.

Calyx: dropping easily with flowers and nutlets;

calyx lobes: 3-4 mm long, 0.5-1 mm broad, linear-oblong, nearly free to base, subacute, inside pilose, outside villose to subtomentose.

Corolla: 6-12 mm long (incl. lobes), infundibular, ± white; **tube** 2.5-3.5 mm long, inside glabrous, outside in lower 3/4 of length pilose; corolla **lobes** 2-3 mm long, triangular-subulate, coiled at tips, **intercalary lobes** about half as long as lobes.

Anthers: 1.2-2.7 mm long, apex slightly hooked inwards, inserted 0.8-1 mm above corolla base.

Stigma: 1-2 mm long, elongate to subulate-conical, beaked near the middle, pilose.

Style: 0.2-0.3 mm long, pilose.

Nutlets: ovoid to subglobose, 1.3-1.4 x 1-1.1 mm large, distinctly rugose, glabrous.

Geo: General distribution: Turkey and Iraq.

Note: *H. circinatum* is limited in distribution to Iraq and Turkey. This species was also reported from Kaluraz near Manjil (BOISSIER & BUHSE 1860). In Flora Iranica it is only cited on base of literature (RIEDL personal communication). According to field studies in this area only *H. bovei* was found frequently. Therefore this record is more likely a misidentification of *H. bovei*.

Flora Iranica 1966

[Seems to synonymise with *H. Haussknechtii*]

48. *H. circinnatum* Grises., Spicil. Fl. Rumel. 2: 78 (1844) in nota. Syn.: *H. Haussknechtii* BNG., Bull. Soc. Nat. Mosc. 42/2: 310 (1869). Typus: Anatolia orientalis, DONETTI, GOET.!

Very similar to the preceding [*H. mamamense*=*H. mamananense*; PoWo, Iranica 1994→*bovei*], it differs by the smaller **corolla**, the corolla **limb** widely infundibuliform, with 5 primary lobes and 5 intercalary **secondary lobes** slightly shorter than the primary ones, inflexed, elongate, subulate-filiform, [and by the] smooth **nutlets**.

Distr. gen.: Anatolia, Persia.

Praecedenti simillimum, differt corolla minore, corollae limbo late infundibuliformi, lobis 5 primariis secundariisque 5 intercalaribus primariis paulo brevioribus introflexis elongatis, subulato-filiformibus, nuculis laevibus.

Syria-Palestine Post 1933

H. circinnatum [=circinatum] Griseb. (1844) (.) (iv. 137).

Key Sections: **Annuals** - **Calyx** persistent after the shedding of the fruit. **Nutlets** 4. - **Stigma**

cupshaped (depressed-conical) - **Corolla-lobes** more or less valvate, **connivent** in bud, straight or curved. - **Limb** of corolla with 5, **supplementary lobes** in sinuses.

Plant: 30 to 50 cm, soft-**appressed-villous**, **canescent**, much branched.

Leaves: ovate and oblong, obtuse, **short-petioled**, prominently nerved at lower surface.

Racemes: often 30 cm long, loose;

Corolla: 5 mm long, hirsute without, glabrous within, **limb** 10-lobed, longer than **tube**, **lobes** triangular at base awl-shaped at apex, **circinnate** in bud, the **intermediate** a little shorter;

Anthers: with inflexed tips;

Stigma: elongated, conical;

Nuts: smooth, glabrous.

Fl.: Summer. Gravelly places.

Geo: No. near Mar'ash (Hn. in Bo).

Boissier Diagnoses 1849

HELIOTROPIUM CIRCINNATUM Griseb. Fl. Rumel. pag. 78. (Sect. Catimas.)

The whole **plant** appressed and softly **canescent**,

leaves: ovate somewhat acute shortly **petiolate** with nerves very prominent beneath,

calyx: hirsute-canescens with oblong-lanceolate **lobes**,

corolla: hirsute with **tube** scarcely longer than the calyx already expanding into the **limb** from the apex of the anther-bearing part,

limb: divisions triangular with convolute **margins** attenuated into setaceous tails circinnately-revolute **inward** before and after anthesis,

anthers: inserted almost at the base of the corolla,

style: almost none,

stigma: from a disciform glabrous base elongate-conical undivided long-bearded,

nutlets: tuberculate glabrous.

Habitat: in Mesopotamia near Mosul Kotschy plants of Aleppo Kurdistan No. 636 under H. grandiflorum. Corolla only 2 lines [4.5 mm] long.

(Claude)

H. totum adpressè et molliter canescens,
foliis ovatis acutiusculis breviter petiolatis nervis subtùs valdè prominulis,
calycis hirsuto-cani partitionibus oblongo-lanceolatis,
corollæ hirtæ tubo calyce vix longiori jam ex apice partis antheriferæ in limbum ampliato,
limbi partitionibus triangularibus margine convolutis in caudas setaceas antè et post anthesin intùs circinnato-revolutas attenuatis,
antheris ferè ad basin corollæ insertis,
stylo subnullo,
stigmatè e basi disciformi glabriusculâ* elongato-conico indiviso longè barbato,
nuculis tuberculatis glabris.
Hab. in Mesopotamiâ* propè Mossoul Kotschy pl. Alepp. Kurd. N° 636 sub H. grandifloro.
Corolla 2 lin. tantùm longa.

ferrugineogriseum

PoWo: Türkiye

Flora of Turkey 1978

2. H. ferrugineogriseum Nab. in Publ. Fac. Sci. Univ. Masaryk Brno 70:16, t. 3 1926).

Similar to *H. circinatum*, but

younger leaves: ferrugineous with small sessile glands mixed with hairs;

leaves: 12-15 mm;

corolla: 8-12 mm, primary lobes +- triangular, secondary lobes much shorter, inflexed;

anthers: inserted near middle of corolla tube, tips not hooked.

Fl.: 7. Alt. 920-1000 m.

Geo: C8 Mardin... Endemic? Ir.-Tur. element.

Note: Known only from the syntypes. Doubt exists as to the location of Nabélek's 'Mar Jakub'

Iranica 1994

* *H. ferrugineo-griseum* Nabélek, Spisy Prir. Fak. Masarykovy Univ., No. 70: 16, t. 3. 1926. Syntypes: Mesopotamia superiore (Gebel et Tur, Tur Abdin) ad monasterium Der el-Ahmar dit. Midiat, ca. 1000 m, 7.7.1910, Nabélek 613 (SAV); in Kurdistania Turcica ad pagum Mar Jakub dit. S'ert, ca. 920 m, 18.7.1910, Nabélek 66 (SAV).

This species was described from Turkish Kurdistan^[sic]. It was doubtfully reported from Iran in Heller & Heyn (1986), but the authors have not seen its type specimens.

Flora Iranica 1966

H. ferrugineo-griseum NAB., Publ. Fac. Sci. Univ. Masaryk (Brno), 70: 16 11926).

Type: Upper Mesopotamia at the monastery Der el-Ahnar, Nab. 613.

Very closely related to the preceding [*circinnatum*] and perhaps a variety of it, differs by the indumentum on the younger leaves being rusty-colored with minute glands mixed among the hairs, corolla up to 12 mm long, the limb between the narrowly triangular primary lobes with subulate apex adorned with inwardly bent triangular teeth much shorter than the lobes.

The species has not yet become known from the area of Flora Iranica, however its occurrence in Kurdistan is to be expected.

Distr. gen.: Kurdistan turcica.

Typus: Mesopotamia superior ad monasterium Der el-Ahnar, Nab. 613. Praecedenti valde affine et forsan ejus varietas, differt indumento in foliis junioribus ferrugineo glandulis minutis pilis immixtis, corolla usque ad 12 mm longa, limbo inter lobos primarios anguste triangulares apice subulatos dentibus triangularibus quam lobi multo brevioribus introflexis ornato. Distr. gen.: Kurdistan turcica. Die Art ist aus dem Gebiet der Flora Iranica noch nicht bekannt geworden, es ist jedoch mit ihrem Vorkommen in Kurdistan zu rechnen.

greuteri

PoWo: Lebanon-Syria, Türkiye

H. grandiflorum Aucher ex DC not *H. grandiflorum* Donn → *H. arborescens* L.

Flora of Turkey 1978

3. *H. greuteri* - H. Riedl in Mouterde, Fl. Lib Syr 3 3 (1977) Syn *H. grandiflorum* Aucher ex DC, Prodr 9 532(1845) non Donn (1811), *H. schweinfurthii* auct non Boiss, Fl Or Suppl. 350 (1888) Figure 11, p. 249

Plant: Annual, to 50 cm.

Stems: erect, branched especially in lower half, densely covered with short subadpressed hairs.

Leaves: 15-60 mm, ovate, obtuse, adpressed-hairy. green above, +- tomentose, greyish especially on veins beneath,

petiole: 1/2 to 2/3 as long as lamina.

Inflorescence: lax, to 20 cm.

Calyx: sessile, 3-3.5 mm, patent white-hairy, deciduous.

Corolla: infundibular, 8-13 mm, lobes short, rounded. [Key:] **involute** in bud, not overlapping, 8-13 mm.

Anthers: inserted at corolla throat.

Stigma: subsessile, cylindrical-subulate from a disc-like base, pubescent at tip.

Nutlets: punctate to verrucose.

Fl.: 7

Type: (E Anatolia?) Armenia, Aucher 2376 (holo G, iso. P').

Geo: N.W., S. & E. Anatolia. A2(A) Bursa nr Bursa... B6 Adana Saimbeyli, Maniss... B7 Malatya Arga to Malatya... Lebanon. E. Medit. element?

Syria-Palestine Post 1933

H. Schweinfurthii Boiss. (1888) ☉ (Suppl. 350).

Key Section: **Annuals** - **Corolla**-lobes more or less valvate, connivent in bud, straight or curved - **Limb** of corolla 5-lobed.

Plant: 30-40 cm, appressed-woolly, canescent.

Leaves: petioled, ovate, obtusish, lineate at upper surface, and prominently **nerved** at lower.

Corolla: hirsute;

anthers: near base of corolla-tube, ending in a long, hooked point;

style: short; **stigma** broad at base, conical-subulate hirsute at tip.

Flw: July, Aug.

Hab: Mountain side, end.

Bunge 1869

27. *Heliotropium grandiflorum*, Auch. El. ex DC. prodr. 9. p. 532. n. 1. excl. pl. Kotschyana. Boiss. diagn. 11. 86.

Habitat: In Armenia (Aucher-Eloy no. 2367!); I have seen a fragment of Aucher's plant kindly communicated by my most friendly Boissier. Whether no. 2362 of Aucher's collection, now cited by De Candolle, also belongs here can only be determined from an accurate investigation of the specimen.

Corolla nearly 5''' [11.3 mm] long, the **lobes** of the limb ovate-triangular, rather acute, a line [2.3 mm] long; the **tube** itself short, dilated into an elongated funnel-shaped throat.

Hab. in Armenia (Auch. Eloy n. 2367!) v. frustulum plantae Aucherianae ab amiciss. Bossier benevole commun. An huc spectet etiam n. 2362 collectionis Aucheriaeae nuc a Candolleo citatum, nonnisi ex accurata investigatione speciminis eruendum. Corolla fere 5''' longa, laciniae limbi ovato-triangulares acutiusculae lineam longae; tubus ipse brevis in faucem elongatam infundibularem dilatatus.

Boissier Diagnoses 1849

HELIOTROPIUM GRANDIFLORUM Aucher. (Sect. Catimas.)

CLAUDE

The whole **plant** closely and softly **canescent**,

leaves ovate obtuse rather long-**petiolate** with **nerves** beneath slightly prominent more intensely hoary,

calyx hirsute-hoary with lanceolate-linear **lobes**,

corolla hirsute with **tube** twice as long as the **calyx** constricted above the sub-basal **anther**-bearing part then gradually dilated into the **limb**,

lobes triangular acute in aestivation by revolution of the margins linear straight converging,

anthers inserted almost at the base of the corolla,

style almost none,

stigma from a disciform glabrous base long conical-subulate at apex deeply bifid hirtellous,

nutlets glabrous tuberculate.

Geo: Found in Armenia Aucher No. 2376.

Corolla 4 lines [9 mm] long. - Under this name this species and the following [circinnatum] have been confused for which reason I restore the diagnosis of both thus.

H. totum adpressè et molliter canescens, foliis ovatis obtusis longiusculè petiolatis nervis subtùs parùm prominulis intensiùs canis, calycis hirsuto-cani partitionibus lanceolato-linearibus, corollæ hirtæ tubo calyce duplò longiori suprà partem antheriferam subbasilarem constricto dein in limbum sensim dilatato, limbi laciniis triangularibus acutis in præfloratione revolutione marginum linearibus rectis conniventibus, antheris ad basin corollæ ferè insertis, stylo subnullo, stigmate e basi disciformi glabriusculá longè conico-subulato apice profundè bifido hirtulo, nuculis glabris tuberculatis. Hab. in Armeniâ Aucher No. 2376. Corolla 4 lin. longa. - Sub hoc nomine hæc species et sequens confusæ fuerunt quâ causâ diagnosin utriusque sic restituo.

haussknechtii

PoWo Bunge: Türkiye

- NB not Vatke

Flora of Turkey 1978

H. haussknechtii Bunge in Bull. Soc Nat Mosc 42 310(1869). Fig. 11, p. 249

Similar to H. circinatum, but

calyx c. 3.5-4 mm, equalling or exceeding corolla-tube;

corolla tube hispidulous, **limb** +- equalling tube, infundibular; **lobes** wider, **margins** crenulate, usually subacute, rarely obtuse to acuminate, **lacking intercalary lobes** or teeth between primary lobes, [key:] **involute** in bud, not overlapping, corolla 5-6 mm,

nutlets indistinctly warty or rugulose, with short retrorse hairs on dorsal surface.

Fl. 6 Alt. 360-600 m.

Bunge 1869

28. Heliotropium Hausknechti n. sp.

CLAUDE

Plant: H. Annual, erect, simple at base, divergently **branched** above, villous-canescens;

leaves: petiolate, ovate-oblong, acute,

spikes: solitary, in fruit **very long**, loosely uniseriate,

calyx: hirsute-villous with linear-lanceolate, erect-patent **lobes** exceeding the [**corolla**] **tube** which is **retrorsely pubescent** outside and glabrous inside,

limb: campanulate-funnelform, five-lobed, much exceeding the **[corolla] tube**, with ovate, very acute, erect-patent, straight **lobes**,

anthers: inserted above the base, linear-lanceolate, with straight, minutely apiculate apex,

stigma: sessile, conical, obtusely bilobed, shortly **puberulent**,

nutlets: rugulose, minutely **hispidulous** on the back.

Habitat: in the Catonian Taurus near Marasch. (Hausknecht!) I have seen a specimen communicated by my friend Boissier.

Fruiting spikes: still flowering at apex, 8-10 inches [21.7-27.1 cm] long.

Fruiting calyx: 2 lines [4.5 mm] long.

Corolla: 3.5 lines [7.9 mm] long, the **tube** itself scarcely 1.5 lines [3.4 mm] long, **limb lobes** scarcely longer than a line [2.3 mm], **anthers** a little shorter than a line [2.3 mm].

GOOGLE

H. annual, erect, simple at base, divaricate-branched above, hairy-gray;

petiolate leaves ovate-oblong acute,

solitary fruit spikes very long loosely uniseriate,

hirsute-villous calyx with linear-lanceolate erect-flat lacinis exceeding the tube from the outside retrorsum pubescentem inside glabrous,

rim campanulate-infundibular five-lobed tube much exceeding with ovate acute very erect-flat lacinis straight,

anthers inserted above the basin linear-lanceolate apex straight minute apiculate,

stigma sessile conical obtuse bilobo briefly pubescent,

nucules rugulose dorsum minute hispidulis.

Habit. in Tauro cataonico prope Marasch. (Hausknecht!) v. s. sp. comm. ab am. Boissier.

Fruit spikes still floriferous at apex 8-10-pollicares.

Fruiting calyx 2 li long.

Corolla 3.5 li long, tube itself scarcely 1.5 li long, the laciniae of the limb scarcely a line [2.3 mm] longer, the anther line slightly shorter.

KEY

Corollae laciniae obtusae vel acutae apice rectae

X Corollae laciniae acuminato-subulatae incurvae vel circinnato involutae

Corollae laciniae acutae vel acutiusculae

X Corollae laciniae obtusissimae rotundatae

Antherae apice rectae, nuculae hispidulae, calyx corollae tubum superans, limbi 5fidi lac. acutissimae

X Antherae hamato-appendiculatae, nuclae glabrae

H. annum, erectum, basi simplex, superne divaricato-ramosum, villosa-canescens;

foliis petiolatis ovato-oblongis acutis,

spicis solitariis fructiferis longissimis laxae uniseriatis,

calycis hirsute-villosi laciniis lineari-lanceolatis erecto-patulis tubum extus retrorsum pubescentem intus glabrum superantibus,

limbi campanulato-infundibularis quinquelobi tubum multo superantis laciniis ovatis acutissimis erecto-patulis rectis,

antheris supra basin insertis lineari-lanceolatis apice rectis minute apiculatis,

stigmatibus sessilibus conicis obtuse bilobis breviter puberulis,

nuculis rugulosis dorso minute hispidulis.

Hab. in Tauro cataonico prope Marasch. (Hausknecht!) v. s. sp. comm. ab am. Boissier.

Spicae fructiferae apice adhuc floridae 8-10-pollicares.

Calyx fructifer 2 li longus.

Corolla 3.5 li longa tubo ipso vix 1.5 li longo, limbi laciniae vix linea longiores, antherae linea parum breviores.

samoliflorum

PoWo: Iran, Türkiye; **spp samoliflorum**: Iran; **spp erzurumicum**: Türkiye

mesinanum Bunge - PoWo has as species, Iranica 1994 maps to H. dissitiflorum Boiss. It is

mentioned because Iranica 1966 samoliflorum description is in terms of it.

PDF samoliflorum 2008

[Slightly modified from Iranica 1994: adds "acute or clavate at apex" for intercalary lobes, "or adpressed hairy" for nutlets, and some inconsequential adjustments to English, omits the Note]

Plant: Annual, 10-50 cm high, branched from base and stem, **villous**, **hairs** 0.5-0.7 mm long, from middle of stem downwards subadpressed, above patent or adpressed.

Leaves: 5-40 mm long, 2-28 mm broad, ovate, ovate-orbicular, elliptic-ovate to suborbicular, obtuse to subacute,

petiole: 0.5-1.2 cm long, margin thickened, +- sinuate, indistinctly revolute; **upper side** subadpressed villous, nerves slightly impressed, **lower side** patent villous, nerves slightly prominent.

Inflorescence: simple or branched; unilateral and uniseriate **cymes** of 5-25 cm long, with 10-50 sessile **flowers**, lax in the lower part.

Calyx: +- persistent after dropping of nutlets; **lobes** 2-3 mm long, 0.3-1 mm broad, linear-oblong, acute, nearly free to base.

Corolla: 3-7 mm long, tubular, glabrous inside, villous outside from middle to downwards, subglabrous upwards; **lobes** 0.6-2.5 mm long, 0.3-1.5 mm broad, oblong, acute or obtuse, alternately arranged with intercalary lobes; **intercalary lobes** linear-filiform, acute or clavate at apex as long as or longer than main lobes.

Anthers: 1-2 mm long, recurved apiculate, inserted 0.7-2 mm above corolla base.

Stigma: 0.9-1.7 mm long, distinctly bilobed, pilose.

Style: 0.2-0.8 mm long, sometimes hidden by **stigma** sparsely pilose to subglabrous.

Nutlets: 0.9-1.5 x 0.7-1 mm, ovoid, black, glabrous or adpressed hairy, obscurely granulate.

1. **Intercalary lobes** acute, **nutlets** glabrous -- subsp. samoliflorum

1. **Intercalary lobes** clavate, **nutlets** hairy -- subsp. erzurumicum [illustration provided]

Iranica 1994

[Superceded by PDF samoliflorum 2008, see note there]

32. *Heliotropium samoliflorum* Bunge, Bull. Soc. Imp. Naturalistes Moscou 42: 314. 1869. Syntypes: in apricis limoso-salsis prope Schurab, [17.5.1859], Bunge s.u., inter urbes Kaschan & Kum, Persiae mediae occidentalis, [10.1868], Bunge & Bienert (G-BOIS!, LE!, P!). Lectotype (hoc loco designatus): in apricis limoso-salsis prope Schurab, [17.5.1859], Bunge s.n. (P! with diagnose; Isotypes: G-BOIS!, K!, M!, P!). Fig.: plate 14 b + c, page 261.

Plant: Annual, 10-50 cm high, branched from base and stem; villose, **hairs** 0.5-0.7 mm long, from middle of stem downwards subappressed, above patent or appressed.

Leaves: 5-40 mm long, 2-28 mm broad, ovate, ovate-orbicular, elliptic-ovate to suborbicular, obtuse to subacute, **petiole** 0.5-1.2 cm long, margin thickened, ± sinuate, indistinctly revolute; **upper side** subappressed villose, nerves slightly impressed, **lower side** patent villose, nerves slightly prominent.

Inflorescence: simple or branched; unilateral und [=and] uniseriate **cymes** of 5-25 cm length, with 10-50 sessile flowers, especially in the lower part laxe^[sic:lax].

Calyx: ± persistent after dropping of nutlets;

calyx lobes: 2-3 mm long, 0.3-1 mm broad, linear-oblong, acute, nearly free to base.

Corolla: 3-7 mm long, tubular, **inside** glabrous, **outside** below middle downwards villose, upwards subglabrous;

corolla lobes: 0.6-2.5 mm long, 0.3-1.5 mm broad, oblong, acute or obtuse, alternately with linear-filiform **intercalary lobes** as long as or longer than main lobes.

Anthers: 1-2 mm long, recurved apiculate, inserted 0.7-2 mm above corolla base.

Stigma: 0.9-1.7 mm long, distinctly bilobed, pilose.

Style: 0.2-0.8 mm long, sometimes hidden by **stigma**, sparsely pilose to subglabrous.

Nutlets: 0.9-1.5 x 0.7-1 mm, ovoide, black, glabrous, obscurely granulate.

General distribution: Endemic in central Iran.

Note: Although this species is very variable in size of leaves and flowers, it is easily to recognize by its characteristical, long intercalary corolla lobes.

Flora Iranica 1966

31. *H. samoliflorum* Bge., Bull. Soc. Nat. Mosc. 42/2: 314 (1869). - Tab. 3, fig. 2; tab. 11, fig. 5. Typus: Persia austro-occidentalis: Prope Shurab inter urbes Kashan et Qom, Bge., P, G!

2. Very closely related to the preceding [*mesinamum*, under this], differing in the larger **leaves** up to 30 mm long, up to 25 mm wide, the denser **inflorescences**, the **calyx** 2.5 mm long with narrowly linear lobes, the **corolla** nearly twice as long as the calyx, 4 mm long, with **throat** strongly constricted, **limb** nearly equal to the tube in length, with 5 **primary lobes** spatulate-oblong, and 5 **secondary lobes** a little shorter, subulate-filiform, **anthers** oblong-linear situated below the middle of the tube, **style** very short, **stigma** conical-subulate, **nutlets** granular in rows.

Distr. gen.: Endem.

Praecedenti valde affine, differt foliis majoribus usque ad 30 mm longis, ad 25 mm latis, inflorescentiis densioribus, calycis 2,5 mm longi laciniis anguste linearibus, corolla calyce subduplo longiore, 4 mm longa, fauce valde constricta, limbi tubo subaequilongi lobis 5 primariis spatulato-oblongis, 5 secundariis paulo brevioribus, subulato-filiformibus, antheris oblongo-linearibus sub medio tubo sitis, stylo brevissimo, stigmate conico-subulato, nuculis seriatim granulosis.

[*mesinamum* provided because above description refers to it]

50. *H. mesinamum* Bge., Bull. Soc. Nat. Mosc. 42/2: 313 (1869). Typus: Persia boreali-orientalis: "Inter Mesinon et Mehr", Bge, P!

1. **Low-growing**, branched in a spreading manner from the base. **Indumentum** of all parts hirsute with spreading whitish hairs, on the undersides of the leaves **rust-colored** through the intermixture of very numerous minute sessile glands. **Stems** branched, more or less prostrate. **Leaves** rather long-petiolate, the upper ones (the only ones known) up to 12 mm long, 9 mm wide, ovate, cuneate at the base or decurrent into the petiole, obtuse at the apex, with nerves slightly impressed above and slightly prominent beneath. **Inflorescences** very lax, more or less flaccid, solitary. **Calyces** sessile or the lower ones shortly pedicellate, 2-2.5 mm long, with 5 lanceolate acute lobes, falling with the nutlets. **Corolla** slightly exceeding the calyx, scarcely 3 mm long, with tube subcylindrical, retrorse-hispid outside, glabrous inside, limb three or four times shorter than the tube, with 5 **primary lobes** subulate-linear, incurved-inflexed into the tube, and 5 **secondary** intercalary lobes subulate, erect, much shorter than the primary ones. **Anthers** situated in the middle of the tube, linear, without apiculus. **Stigma** sessile, shortly conical from a dilated base, hispidulous at the apex. **Nutlets** glabrous, smooth.

Distr. gen.: Endem.

Humile, a basi divaricatim ramosum. Indumentum partium omnium pilis patentibus albidis hirsutum, in foliis subtus glandulis minutis sessilibus numerosissimis immixtis ferrugineum. Caules ramosi, +- prostrati. Folia longiuscule petiolata, superiora (sola nota) usque ad 12 mm longa, 9 mm lata, ovata, basi cuneata vel in petiolum decurrentia, apice obtusa, nervis supra paulo impressis subtus paulo prominentibus. Inflorescentiae laxissimae +- flaccidae, singulae. Calyces sessiles vel inferiores breviter pedicellati 2-2,5 mm longi, laciniis 5 lanceolatis acutis, cum nuculis decidui. Corolla calycem paulo superans vix 3 mm longa, tubo subcylindrico extra retrorse hispido, intus glabro, limbo tubo triplo vel quadruplo breviori lobis 5 primariis subulato-linearibus in tubum incurvato-inflexis, 5 secundariis intercalaribus subulatis erectis primariis multo brevioribus. Antherae medio in tubo sitae, lineares, exapiculatae. Stigma sessile e basi dilatata breviter conicum, apice hispidulum.

Nuculae glabrae, laeves.

Bunge 1869

Heliotropium samoliflorum n. sp.

Plant: Annual *Heliotropium*, branched from the base in a divaricate manner, somewhat hairy backwards;

leaves: long-petiolate, ovate or the upper ones suborbicular, obtuse, beneath densely callous-pubescent;

spikes: solitary, uniseriate, elongate;

flowers: contiguous during anthesis, finally somewhat remote;

calyx: lobes erect-patent, shorter than the corolla tube which is hispidulous backwards externally and glabrous internally;

limb: infundibular, deeply ten-lobed, externally glabrous, the outer lobes erect-patent with straight apices, spathulate-oblong,

the intercalary lobes: subulate-filiform, elongate, nearly equaling the outer ones;

anthers: inserted above the base, scarcely incurved at apex, obtuse, included;

stigma: conical-subulate, bifid, sparsely puberulent, many times exceeding the hispidulous or glabrous style;

nutlets: smooth, glabrous, very finely granulate in rows.

Habitat: In sunny, muddy-saline places near Schurab, between the cities of Kashan and Qum in west-central Persia. (Bge & Bienert!) Living specimen seen.

A species most distinct from all others by the singular structure of the corolla. Primary stem abbreviated up to the primary spike, 1-2 inches, dissolving into divaricate branches. Lower leaves more than an inch long and 9-10 lines [20.3-22.6 mm] wide above the base, supported by a petiole about 8 lines [18 mm] long; upper leaves smaller, more briefly petiolate, very obtuse. Spikes 3-4 inches long, with the fruiting calyces somewhat distant. Calyx lobes slightly exceeding a line [2.3 mm]. Corollas 2½ lines [5.6 mm] long or a little longer, with the tube exceeding the limb.

Heliotropium samoliflorum n. sp. H. annuum, a basi divaricato-ramosum, retrorsum villosulum; foliis longe petiolatis ovatis vel superioribus suborbiculatis obtusis subtus dense calloso-pubescentibus, spicis solitariis uniseriatis elongatis, floribus sub anthesi contiguis denique parum remotis, calycis laciniis erectopatulis corollae tubo extus retrorsum hispidulo intus glabro brevioribus, limbi infundibularis profunde decemfidi extus glabri laciniis exterioribus erecto-patulis apice rectis spathulato-oblongis intercalaribus subulato-filiformibus elongatis exteriores subaequantibus, antheris supra basin insertis apice vix incurvis obtusis inclusis, stigmatibus conico-subulato bifido parce puberulo stylum hispidulum glabrumve pluries superante, nuculis laevibus glabris tenuissime seriatim granulatis. Hab. in apricis limoso-salsis prope Schurab, inter urbes Kaschan & Kum Persiae mediae occidentalis. (Bge & Bienert!) v. v. sp. Species corollae structura singulari ab omnibus distinctissima. Caulis primarius abbreviatus usque ad spicam primariam 1-2 pollicaris, in ramos divaricatos solutus. Folia inferiora plus quam pollicaria & lineas 9-10 supra basin lata, petiolo circiter 8''' longo fulta, superiora minora, brevius petiolata obtusissima. Spicae 3-4 pollicares, calycibus fructiferis parum distantibus. Calycis lacinae lineam parum excedentes. Corollae 2 1/2''' longae vel parum longiores, tubo limbum superante.

europaeum s.l.

Iranica 1994

20. *Heliotropium europaeum* L., Sp. pi. 1: 130. 1753 sensu lato. Lectotype (FURTHER in Jarvis 1993: 53): Herb. Cufford: 45, *Heliotropium* ^r. 1 (BM!). = *Heliotropium ellipticum* Ledeb. in Eichw., Pl. nov. 1: 10, tab. 4. 1831 = H. *europaeum* L. var. *ellipticum* (Ledeb.) Regel, Bull. Soc. Imp. Naturalistes Moscou 41: 75. 1868 = H. *europaeum* L. var. *ellipticum* (Ledeb.) Kuntze, Trudy Imp. S.-Peterburgsk. Bot. Sada 10: 212. 1887 nom. superfl. = H. *ellipticum* Ledeb. var. *typicum* Popov, Trudy Glavn. Bot. Sada 42: 221. 1931 nom. illegit. = H. *eichwaldi* Steud., Nomencl.

Bot. ed. 2, 1: 744. 1840, nom. illegit. = *H. europaeum* L. var. *eichwaldi* (Steud.) Fiori & Paol., Fl. anal. Ital. 2: 383. 1902. Holotype: Turcomania, ad litus Orientale maris Caspii prope Krasnowodsk, [ad sinum Balchasch m. caspici in insula Dagada & pr. Krasnowodsk, 1827], Eichwald (LE!). ^) = *H. lasiocarpum* Fisch. & C.A.Mey., Index sem. hort. Petrop. 4: 38. 1837 = *H. eichwaldi* Steud. var. *lasiocarpum* (Fisch. & C.A.Mey.) C.B.Clarke in Hook.f., Fl. Brit. India 4(10): 150. 1883 = *H. ellipticum* Ledeb. var. *lasiocarpum* (Fisch. & C.A.Mey.) Popov, Trudy Glavn. Bot. Sada 42: 221. 1931 = *H. europaeum* L. var. *lasiocarpum* (Fisch. & C.A.Mey.) Kazmi, J. Arnold Arb. 51: 176. 1970. Lectotype (hoc loco designatus): in litore orientali maris Caspii [Penin. Dardscha], Eichwald (LE!, Isotypes: K, LE!). = *H. strictum* Ledeb., Fl. Ross. 3: 100. 1847, non Humb., Bonpl. & Kunth 1818, nom. illegit.. Syntypes: in sibiria uralensi; in Turcomannia, Karelin pi. exs. [= in salsis songoriae ad lacus Kly prope fontem Sassyk-pastau et montes Arganat, 1841, Karelin & Kirilov 1722 (K!, LE!, M!, MW, P!, W!)]]; in alzaica, in deserto soongoro-kirghisico ad lacum Noor-Saisan, Gebier pi. exs. Lectotype (hoc loco designatus): in alzaica, in deserto soongoro-kirghisico ad lacum Noor-Saisan, Gebier (LE!: Nor-Saisan, s.coll. propably Gebier ex Herb. Ledeb. with hand-written note: *H. strictum* mihi; Isotypes: BR!, M!). = *H. littorale* Steven, Bull. Soc. Imp. Naturalistes Moscou 24(2): 565. 1851, non Colla 1835, nom. illegit. = *H. ellipticum* Ledeb. var. *littorale* (Steven) Kusn. & N.P.Popov in Kusn., N.Busch & Fomin, Fl. cauc. critica 4 (2): 90. 1914. Lectotype (hoc loco designatus): in arena littorali circa Sudak, 4.7.1848, Steven (H 1535717!; Isotypes: GOET!, LE!, M!, P!, W!, WAG!). = *H. tenuiflorum* Bunge, Bull. Soc. Imp. Naturalistes Moscou 42: 293. 1869 non Colla 1835, nom. illegit. = *H. europaeum* L. var. *tenuiflorum* Boiss., Fl. or. 4: 130. 1879. = *H. europaeum* L. var. *ellipticum* (Ledeb.) Kuntze f. *crispulum* Kuntze, Trudy Imp. S.-Peterburgsk. Bot. Sada 10: 212. 1887. Holotype: Turkmenen-Steppe, 5.1886, Kuntze 529 (NY! microfiche). = *H. europaeum* L. var. *exsertum* Kuntze, Trudy Imp. S.-Peterburgsk. Bot. Sada 10: 212. 1887. Holotype: Krasnowodsk, 5.1886, Kuntze 529b (NY! microfiche). = *IH. dolosum* De Not., Repert. fl. ligust.: 284. 1844. Type: in litore Liguriaee occiduue prope il Ceriale, hortulanus H.R. (non vidi). Fig.: plate 7 c, page 235.

Plant: Annual, 5-60 cm high, erect or ascending, indument appressed or patent.

Leaves: up to 6 cm long and 4 cm broad, ovate to elliptic, rounded or acutish at top, cuneate to almost rounded at base, petiole up to 3.5 cm.

Inflorescence: often branched; cymes dense, in fruiting time biseriate and bilateral.

Calyx: persistent after nutlets falling;

calyx lobes: 1.8-3.2 mm long, 0.4-1.1 mm broad, lanceolate to oblong-linear.

Corolla: 2-5 mm long; corolla lobes rounded, without intercalary lobes, sometimes shortly denticulate.

Anthers: 0.7-1.5 mm long, inserted 0.6-1 mm above corolla base.

Stigma: conical to linear subulate, pilose or glabrous.

Nutlets: pilose or glabrous.

General distribution: Europe, southwest and central Asia to India.

Note: The widespread *H. europaeum* group (incl. *H. europaeum* s.str., *H. dolosum*, *H. ellipticum*, *H. lasiocarpum* and *H. strictum*) includes mainly annual weedy plants. The taxonomic situation is not satisfactorily clarified [see also Riedl (1967), Brummitt (1972) or Nasir (1989)] because this taxon is extremely variable in all characters throughout its enormous geographical range. Already Brummitt (1971) who has studied this group for Flora Europaea claimed that the distinction between taxa of concerning group in Europe and those of southwest Asia is not clear. The existence of any combinations of all characters (e.g. shape of corolla tube, length and indument of stigma, etc.) does not allow to separate of distinct taxa, but in general there might be clinal changes from West to East in increasing density of nutlets' indument. As there are found any intermediates between the extreme forms of *H. europaeum* s.l. in any part of the wide distribution range all specimens are cited together in one enumeration. At the moment it does not seem to be justified to differentiate *H. europaeum* s.l. into distinguishable taxa by any strange combination of characters or distribution patterns.

Flora of Georgia 2001 (Key)

4a. Nutlets are slightly wrinkled-tubercular, naked (glabrous). Corolla 3-4 mm long; stigma almost sessile, entirely covered with short downy hairs. Stem is 15-40 cm in height -- 3. *H. ellipticum* Ledeb.

4b. Nutlets are smooth, sparsely hairy. Corolla 5-6 mm long. Stigma is situated on a style up to 2 mm long. Stem is 10-12 cm in height -- 5. *H. dolosum* DC.

(Gemini 2026.01.15)

4a. კაკლუჭები სუსტად ნაოჭიან-ზოგჯერ კლიანია, შიშველი. გვირგვინი 3-4 მმ სიგრძის; დინგი თითქმის მჯდომარე, მთლიანად მოკლე ბუსუსიანი. ღერო 15-40 სმ სიმაღლისაა -- 3. *H. ellipticum* Ledeb.

4b. კაკლუჭები გლუვია, მეჩხერბეჭვიანი. გვირგვინი 5-6 მმ სიგრძის. დინგი 2 მმ-მდე სიგრძის სვეტზეა მოთავსებული. ღერო 10-12 სმ სიმაღლისაა -- 5. *H. dolosum* DC.

Transcription: Gemini unchecked

Flora of Armenia 1980 (Key)

[See keys at top, translated by Claude 2026.01.15]

3b. Corolla smaller, with a distinctly expressed limb, calyx not more than 1.5-2 times shorter than the corolla. Mericarps ovoid -- 4

4a. Upper part of the style subulate-filiform, elongate, apex bifid, not pubescent. Mericarps with more or less expressed sculpture. Leaves yellowish-green, oblong -- 1. *H. europaeum* L.

4b. Upper part of the style elongate-conical, not bifid, often weakly pilose -- 5

5a. Mericarps densely pubescent, entire plant appressed velvety-pubescent. Sepals spreading-pilose, curved upward. Leaves obovate, rounded at the apex -- 4. *H. lasiocarpum* Fisch. et C. A. Mey.

5b. Mericarps glabrous -- 6

6a. Mericarps smooth or weakly reticulate-rugose, 1.5 mm long. Calyx teeth stellately spreading in fruit -- 3. *H. ellipticum* Ledeb.

6b. Mericarps coarsely tuberculate, about 2 mm long. Calyx teeth long spreading-pilose, more or less curved upward in fruit, but sometimes also stellately spreading -- 2. *H. dolosum* De Not.

Italica 1923

(The other species being *H. supinum*)

A) *Lvs.* ovate, subobtus. Fr. *calyx* generally stellate-patent, with linear-lanceolate lobes.

a) *Fls.* almost inodorous, with corolla *limb* diam. 2-4 mm., with somewhat acute lobes. *Stigma* elongate-conical.

I) *Achenes* almost glabrous. *Corolla* longer than calyx.

Δ) *Plant* 1-4 dm. Fr. *calyx* with stellate-patent lobes. - Istria, Pen. and islands. -- α *TYPICUM*

ΔΔ) *Plant* 2-5 cm. Fr. *calyx* with erect lobes, enclosing the fruit (without falling with it). - Cors. at Biguglia. β *MARITIMUM* CHABERT (1892)

II) *Achenes* pilose. *Corolla* small, barely exceeding calyx. *Plant* mostly pubescent-whitish, with very hirsute calyces and more compact spikes. - Here and there: Camp., Nap., Ischia, Basil., Cal., Sic. and Eolie; 2. [Grec. Rhodes W. As. N. Afr.]. -- γ) *TENUIFLORUM* GUSS. (1827) (GUSS., 1842)

b) *Fls.* fragrant, with corolla *limb* diam. ca. 5 mm., with very obtuse lobes. *Stigma* shortly conical. - *Achenes* glabrous. - Ischia, Cal. at Castrovillari, Sic. and Eolie; 2. [Grec.]. --- *H. aethnium* Jan (1827) - *H. suaveolens* Caruel (1886), non M. B. -- δ *BOCCONEI* (GUSS., 1825)

B) **Lvs.** ovate-elliptic, rounded at both ends. Fr. **calyx** subpatent, with ovate-lanceolate lobes. - **Plant** cinereous-pubescent. **Fls.** fragrant. Corolla with limb diam. ca. 2 mm. **Stigma** elongate-conical. **Achenes** glabrous. - W. Lig. at Ceriale, Laz. at Castel di Decima and Carroceto, Nap. (Vesuvius, Pompeii etc.), Ischia, Capri, Basil. at Muro, Linosa and Lamped.; 2. [E. Eur. W. and centr. As.]. - H. **dolosum** DNtrs. (1844) - H. macrocarpum Guss. (1854). -- € EICHWALDI (STEUD., 1840)

Claude 2026.01.09

A) Fg. ovate, ottusette. Calice frutt. generalm. patente a stella, a lacinie lineari-lanceolate.

a) Fi. quasi inodori, a lembo corollino del diam. di 2-4 mm., con lobi un po' acuti. Stemma allungato-conico.

l) Acheni quasi glabri. Corolla più lunga del calice.

Δ) Pianta di 1-4 dm. Calice frutt. a lacinie patenti a stella. - Istria, Pen. ed isole. -- α TYPICUM

ΔΔ) Pianta di 2-5 cm. Calice frutt. a lacinie raddrizzate, racchiudenti il frutto (senza cadere con esso). - Cors. a Biguglia. B MARITIMUM CHABERT (1892)

II) Acheni pelosi. Corolla piccola, appena superante il calice. Pianta maggiorm. pubescente-biancastra, a calici irsutissimi e spighe più compatte. - Qua e là: Camp., Nap., Ischia, Basil., Cal., Sic. ed Eolie; 2. [Grec. Rodi As. occ. Afr. bor.]. -- γ) TENUIFLORUM GUSS. (1827) (GUSS., 1842)

b) Fi. odorosi, a lembo corollino del diam. di circa 5 mm., con lobi ottusissimi. Stemma brevem. conico. - Acheni glabri. - Ischia, Cal. a Castrovillari, Sic. ed Eolie; 2. [Grec.]. --- H. aethnium Jan (1827) - H. suaveolens Caruel (1886), non M. B. -- δ BOCCONEI (GUSS., 1825)

B) Fg. ovato-ellittiche, arrotondate alle 2 estremità. Calice frutt. subpatente, a lacinie ovato-lanceolate. - Pianta cenerino-pubescente. Fi. odorosi. Corolla a lembo del diam. di circa 2 mm. Stemma allungato-conico. Acheni glabri. - Lig. occ. al Ceriale, Laz. a Castel di Decima e Carroceto, Nap. (Vesuvio, Pompei ecc.), Ischia, Capri, Basil. a Muro, Linosa e Lamped.; 2. [Eur. or. As. occ. e centr.]. - H. dolosum DNtrs. (1844) - H. macrocarpum Guss. (1854). -- € EICHWALDI (STEUD., 1840)

Transcription: Gemini+OCR winmerge-compared

europaeum

PoWo: **Native:** Afghanistan, Albania, Algeria, Austria, Azores, Balears, Bulgaria, Canary Is., Corse, Cyprus, Czechia-Slovakia, East Aegean Is., Egypt, France, Germany, Greece, Gulf States, Hungary, India, Iraq, Italy, Kazakhstan, Kriti, Krym, Lebanon-Syria, Libya, Madeira, Morocco, North Caucasus, NW. Balkan Pen., Oman, Pakistan, Palestine, Portugal, Romania, Sardegna, Sicilia, South European Russia, Spain, Switzerland, Transcaucasus, Tunisia, Türkiye, Türkiye-in-Europe, Ukraine, Yemen.

Intro: (N America, Africa, Australia, Asia): Alabama, Arkansas, California, Cape Provinces, China North-Central, Delaware, District of Columbia, Eritrea, Ethiopia, Florida, Georgia, Illinois, Maryland, Massachusetts, Mississippi, New Jersey, New South Wales, New York, North Carolina, Ohio, Pennsylvania, South Australia, South Carolina, Texas, Victoria, Virginia, West Virginia, Xinjiang

tenuiflorum Guss. - PoWo maps to europaeum L. - the hairy nutlet form of europaeum

tenuiflorum (Boiss.) Guss. - PoWo maps to lasiocarpum Fisch. & C.A.Mey. - the hairy nutlet form of ellipticum i.e. with broad calyx lobes

Flora of Turkey 1978

7. H. europaeum L. Sp. Pl. 130 (1753). Syn: H. commutatum Roemer & Schultes, Syst. Veg 4 29 (1819); H. stevenianum Andr. in Besser, Enum. Pl. Volhyn. 116 (1822); H. incanescens Andr. in Besser, loc. cit. (1822); ?H. carduchorum C. Koch in Linnaea 22:627 (1849). Ic: Coste, Fl. Fr. 2:609, t. 2617 (1903); Hess et al. Fl. Schweiz 3 62 (1972) Figure 11, p. 249.

Plant: Annual, with ± soft adpressed hairs.

Stems: divaricately branched, pale.

Leaves: ovate, obtuse to subacute, to 35(-40) mm, green or greyish, petiole usually c. 1/2 as long as lamina.

Inflorescence: dense, sometimes rather lax in fruit.

Calyx: subsessile, 2.5 mm, lobes lanceolate, spreading in fruit.

Corolla: 3-3.5 mm, tube cylindrical, limb short, ± rotate, c. 2.5 mm, hairy outside.

Stigma: subsessile, conical with an elongate, subfiliform, deeply bifid tip, usually glabrous.

Anthers: inserted near base of corolla tube.

Nutlets: glabrous (in Turkey), grossly tuberculate, rarely nearly smooth.

Fl.: 6-9. Orchards, fields, s.l.-1400 m.

Described from: S. Europe.

Note: Plants with hairy nutlets from Turkey named as *H. europaeum* proved to belong to *H. lasiocarpum*.

Flora of China

5. *Heliotropium europaeum* Linnaeus, Sp. Pl. 1: 130. 1753.

Plant: Herbs annual, 20-50 cm tall.

Stems: erect or ascending, branched from base, **strigose** or hirtellous.

Petiole: 1-4 cm; leaf blade elliptic to elliptic-ovate, 1.5-4 × 1-2.5 cm, **abaxially** gray-green and densely hirtellous, **adaxially** green and sparsely hirtellous, **base** widely cuneate to rounded, **apex** obtuse to acute.

Cymes: terminal and axillary, scorpioid, simple or dichotomously **branched**, 2-4 cm.

Flowers: sessile.

Calyx: **lobes** ovate to ovate-lanceolate, 2-3 × 1-1.5 mm, not enlarged in fruit, strigose.

Corolla: white, 4-5 mm, base 1.5-2 mm wide; **throat** slightly contracted; **limb** (2-)3-4 mm wide; **lobes** rounded, ca. 1.5 mm wide, short strigose outside, glabrous inside.

Anthers: ovate-oblong, ca. 1 mm, without **filaments**, attached ca. 1 mm above base of corolla tube.

Ovary: globose, 0.5-0.7 mm in diam.

Style: short;

stigma: long conical, deeply 2-cleft, 1.2-1.5 mm, **ringlike portion** glabrous, apex short strigose.

Fruit: 2.5-3 mm in diam.;

mericarps: ovate, ca. 2 mm, ± distinctly tuberculate, glabrous.

Fl. and fr.: Jul-Sep. 2n = 24, 32, 48.

Hab: Gravelly deserts, river banks, valleys; 100-800 m.

Geo: Naturalized in W Gansu, Xinjiang [Afghanistan, India, Pakistan, Russia; N Africa, SW Asia, S Europe].

Flora Iberica 2012

1. *H. europaeum* L., Sp. Pl.: 130 (1753) [*europaeum*] *H. europaeum* var. *tenuiflorum* Guss., Fl. Sicul. Prodr. 1: 205 (1827) Ind. loc.: "Habitat in Europa australi" [lectotipo designado por H. Förther in Regnum Veg. 127: 53 (1993): BM 557900 ex herb. Clifford: 45] lc.: Rchb. fil. in Rchb., Icon. Fl. Germ. Helv. 18, tab 93 (1858); Valdés, Talavera & Galiano (eds.), Fl. Andalucía Occid. 2: 376 (1987)

GOOGLE

Plant: Herb up to 50(60) cm tall, annual, ± silky.

Stems: erect or ascending, simple or branched from the base, ± silky, with appressed hairs of varying sizes, the longest up to 1.5 mm.

Leaves: with petioles 0.5-4.5(6) cm long; blade (1.5)3-7(9) × (0.5)2-3(4.5) cm, elliptic, ovate, or lanceolate, rounded or attenuate at the base, obtuse, sometimes subacute, with a ± silky indumentum, with appressed hairs of varying sizes, the longest up to 1 mm, somewhat conspicuous

on the veins of the underside.

Inflorescence: with dense, paired cymes, up to 15 cm long in flowering and up to 20(22) cm long in fruit.

Flowers: ebracteate, sessile.

Calyx: divided almost to the base, persistent until after fruit fall, 1.5-3 mm long in flower, slightly or not at all accrescent in fruit, \pm campanulate, \pm villous, with straight hairs; **lobes** linear to linear-lanceolate, subacute, on the outer surface with erect or erect-spreading hairs up to 1(1.2) mm long, and appressed hairs up to 0.3 mm long, and on the inner surface only with appressed hairs.

Corolla: funnel-shaped, 2-4(5) mm in diameter, \pm hairy externally; tube (1)1.3-2.5(3) mm, the length of the calyx or slightly longer;

lobes: (0.3)0.5-1.5(1.7) \times 0.5-1.5 mm, wavy, slightly oblong to \pm suborbicular, with a longitudinal fold between the lobes, sometimes ending in a small tooth, the veins hairy, the rest glabrous.

Stamens: inserted near the base of the corolla tube;

anthers: 0.7-1(1.2) mm, nearly conical, acute, yellowish-brown.

Ovary: with a **style** 0.2-0.5 mm, usually glabrous; **stigma** discoid, prolonged into a sterile appendage 1-1.5(1.6) mm, conical, usually bifid and glabrous or weakly papillose.

Fruit: entire, usually with 4 nutlets.

Nutlets: 1.5-2.5 \times (1)1.2-1.8 mm, ovoid, \pm trigonous, with the back irregularly rugulate-alveolate to weakly tuberculate, sometimes linearly arranged, glabrous or hairy, dark brown to yellowish-brown.

2n = 32, 48*; **n** = 12*, 16.

Hab: Arable and ruderal; 0-1750 m. (II)III-XI(XII).

Geo: S, C and W Europe, Macaronesia -except Cape Verde-, N Africa, SW Asia. Throughout almost the entire Iberian Peninsula and Balearic Islands. Esp.: A Ab Al Av B Ba Bi Bu (C) Ca Cc Co CR Cs Cu Ge Gr Gu H Hu Ib J L Le Lo Lu M Ma Mu Na (Or) PM[(Ib) Mll Mn] (P) Po S Sa Sg Se So SS T (Te) To (V) Va Vi Z Za. Port.: AAl Ag BA BAl BB BL DL E TM. N.v.: alacranera (Valencia), heliotropium major, scorpion grass (Córdoba), verruguera, yerba hornuda, yerba verruguera; port.: erva-das-verrugas, tornassol, tornassol-cum-pêlos, verrucária, verrucária-peluda; cat.: cua d'alacrà, cua d'escorpi, herba berruguera, herba passarella, matapassarell, morritort, morrotort, sunflower bort.

Hierba hasta de 50(60) cm, anual, \pm sericea. Tallos erectos o ascendentes, simples o ramificados desde la base, \pm seríceos, con pelos adpresos de distinto tamaño, los más largos hasta de 1,5 mm. Hojas con peciolo de 0,5-4,5(6) cm; limbo (1,5)3-7(9) \times (0,5)2-3(4,5) cm, elíptico, ovado o lanceolado, redondeado o atenuado en la base, obtuso, a veces subagudo, con indumento \pm seríceo, con pelos adpresos de distinto tamaño, los más largos hasta de 1 mm, algo patentes en los nervios del envés. Inflorescencia con cimas geminadas, densas, hasta de 15 cm en la floración y hasta de 20(22) cm en la fructificación. Flores ebracteadas, sésiles. Cáliz dividido casi hasta la base, persistente hasta después de la caída del fruto, en flor de 1,5-3 mm, en fruto poco o nada acrescente, \pm campanulado, \pm viloso, con pelos rectos; lóbulos de lineares a linear-lanceolados, subagudos, en la cara externa con pelos erectos o erecto-patentes, hasta de 1(1,2) mm, y adpresos hasta de 0,3 mm, y en la cara interna solo con pelos adpresos. Corola infundibuliforme, de 2-4(5) mm de diámetro, \pm pelosa externamente; tubo (1)1,3-2,5(3) mm, de la longitud del cáliz o un poco más largo; lóbulos (0,3)0,5-1,5(1,7) \times 0,5-1,5 mm, ondulados, de ligeramente oblongos a \pm suborbitales, con un pliegue longitudinal entre los lóbulos, a veces terminado en un pequeño diente, los nervios pelosos, el resto glabro. Estambres insertos cerca de la base del tubo de la corola; anteras 0,7-1(1,2) mm, casi cónicas, agudas, pardo-amarillentas. Ovario con estilo de 0,2-0,5 mm, generalmente glabro; estigma discoide, prolongado en un apéndice estéril de 1-1,5(1,6) mm, cónico, generalmente bifido y glabro o débilmente papiloso. Fruto entero, generalmente con 4 núculas. Núculas 1,5-2,5 \times (1)1,2-1,8 mm, ovoides, \pm trigonas, con el dorso de irregularmente rugulado-alveolado a débilmente tuberculado, a veces en disposición linear, glabro o peloso, de un pardo oscuro a pardo-amarillentas. **2n** = 32, 48*; **n** = 12*, 16. Arvense y ruderal; 0-1750 m. (II)III-XI(XII). S, C y W de Europa, Macaronesia -excepto Cabo Verde-, N de África, SW de Asia. Por casi toda la Península Ibérica e Islas Baleares. Esp.: A Ab Al Av B Ba Bi Bu (C) Ca Cc Co CR Cs Cu Ge Gr Gu H Hu Ib J L Le Lo Lu M Ma Mu Na (Or) PM[(Ib) Mll Mn] (P) Po S Sa Sg Se So SS T (Te) To (V) Va Vi Z Za. Port.: AAl Ag BA BAl BB BL DL E TM. N.v.: alacranera (Valencia), heliotropio mayor, hierba del alacrán (Córdoba), verruguera, yerba cornuda, yerba verruguera; port.: erva-das-verrugas, tornassol, tornassol-cum-pêlos, verrucária, verrucária-peluda; cat.: cua d'alacrà, cua d'escorpi, herba berruguera, herba passarella, matapassarell, morritort, morrotort, girasol bort.

Flora Europaea 1972

1. H. europaeum L., Sp. Pl. 130 (1753).

Flowers: scentless.

Sepals: 0.4-0.8 mm wide, linear-oblong or narrowly triangular, irregularly patent-pubescent,

usually patent soon after anthesis.

Corolla: 2-4.2 mm.

Anthers: 0.7-1 mm.

Stigma: linear-subulate, usually glabrous.

Fruit: glabrous or pubescent, usually rugose.

Geo: S., C. & W. Europe, northwards to N. France, Czechoslovakia & C. Ukraine; occasionally as a weed or casual further north. Al Au Az Bl Bu Co Cr Cz Ga Ge Gr He Hs Hu It Ju Lu Rm Rs (W, K, E) Sa Si Tu.

Note: Variable in flower-size and fruit-pubescent.

Bunge 1969

CLAUDE

5a. **Calyx lobes** linear, **corolla** spreading-pubescent or glabrescent at base, **stigma** glabrous -- 6.

5b. Calyx lobes oblong-linear or ovate, corolla reverse-pubescent at base, stigma hispidulous -- 7.

6a. **Nutlets** glabrous (rarely very sparsely hispidulous), pitted-extremely rugose, **calyx lobes** very widely spreading in fruit, **corolla limb** spreading, **intercalary lobes** nearly absent, **stigma** subulate-conical, deeply unequally bifid -- *H. europaeum*.

6b. Nutlets densely hispidulous, rather smooth. Corolla limb erect, intercalary lobes rather large, stigma briefly conical, very briefly obtusely bilobed, calyx lobes connivent -- *H. tenuiflorum* [a Crimean variety according to USSR].

7a. Nutlets rather smooth, very finely shining-granulate, completely glabrous, calyx lobes appressed to fruit, spikes lax, intercalary lobes rather large -- *H. eichwaldi* [=ellipticum]

7b. Nutlets hispid-velvety, sparsely verrucose, calyx lobes oblong connivent, spikes condensed, intercalary lobes tooth-shaped -- *H. lasiocarpum*

5a. Calycis laciniae lineares, corolla basi patulo pubescens vel glabrescens, stigma glabrum -- 6.

5b. Calycis laciniae oblongo - lineares vel ovatae, cor. basi reverso-pubescens, stigma hispidulum -- 7.

6. Nuculae glabrae (raro pareiss. hispidulae) serobiculato-rugosissimae, caly- cis laciniae in fructu patentissimae, corollae limbo patulo, lacinii intercalaribus subnullis, stigma subulato-conicum profunde inaequaliter bifidum -- *H. europaeum*.

6b. Nuculae dense hispidulae laeviusculae. Corollae limbus erectus, laciniae intercalares majusculae, stigma breviter conicum, brevissime obtuse bilobum, calycis laciniae conniventes -- *H. tenuiflorum*.

7a. Nuculae laeviusculae tenuissime lucido-granulatae glaberrimae, cal. laciniae fructui adpressae, spicae laxae, lac interc. majusc. -- *H. eichwaldi*

7b. Nuculae hispido-velutinae parce verrucosae, calycis laciniae oblongae conniventes, spicae condensatae, lac. intercalares dentiformes -- *H. lasiocarpum*

europaeum L.

6. *H. europaeum* L. sp. 187. DC. prodr. l. c. n. 9. Syn. *H. subcanescens*. Andrzej, Steven l. c. n. 3 ! e speciminibus Stevenianis numerosis. Hab. in cultis & ruderalis Europae australioris & Africae borealis. Vidi e Lusitania! Gallia! Italia! Corsica! Sardinia! Sicilia! Graecia! Rossia australi! Tauria! Caucaso! Algeria!

Variable species: with **racemes** elongate or abbreviated, **flowers** larger or smaller, **nutlets** however always deeply pitted-warty, very often glabrous, more rarely sparsely hispidulous toward the base. The **limb** of the **corolla** usually very spreading during flowering, with one or another of the **intercalary lobes** minute tooth-like, sometimes almost none. The **Portuguese** plant differs from all forms in having more densely hispid nutlets (Welwitsch. pl. exs.); the **Sicilian** plant collected by Tornabene on Mount Etna, perhaps the true *H. tenuiflorum* Guss., differs in having much smaller **corollas**, in all other respects it agrees with the genuine species. Specimens collected in **Liguria** by Count Cesati present a somewhat different habit, with thick abbreviated spikes; finally the **Arabian** plant (Schimp. n. 847.), which I have seen only in a juvenile state, approaches rather *H. lasiocarpum* (see above), and perhaps is nothing but a southern form of it.

Species variabilis: racemis elongatis vel abbreviatis, floribus majoribus vel minoribus, nuculis tamen semper profunde scrobiculato-verrucosis, saepissime glabris, rarius basin versus parce hispidulis. Corollae limbus plerumque sub anthesi patentissimus, lacinii intercalaribus una alterave minutis dentiformibus, interdum fere nullis. Planta lusitanica ab omnibus formis recedit nuculis densius hispidis (Welwitsch. pl. exs.);

planta Sicula a Tornabene in monte Aetna collecta, forsan verum *H. tenuiflorum* Guss., recedit corollis multo minoribus, omnibus caeterum cum specie genuina convenit. Specimina in Liguria a com. Cesati collecta, habitum prae se ferunt paulo alienum, spicis crassis abbreviatis; planta denique arabica (Schimp. n. 847.), quam vero tantum juvenilem vidi, potius ad *H. lasiocarpum* accedit (v. supra), & forsan nil nisi forma ejus australis.

dolosum

PoWo: **Native:** Bulgaria, Cyprus, East Aegean Is., Greece, Gulf States, Iran, Italy, Kriti, Krym, Romania, Transcaucasus, Türkiye, Türkiye-in-Europe, Ukraine. **Doubtful:** Sicilia

Flora of Turkey 1978

8. *H. dolosum* De Not., Repert. Fl. Ligust. 284 (1844). Syn: *H. eichwaldii* auct. non Steud., Nom. ed. 2, 1:744 (1840); *H. macrocarpum* Guss., Enum. Pl. Inar. 214, t. 7 (1854); ?*H. pycnanthum* Cand. in Bull. Soc. Bot. Fr. 44-462 (1897). Ic Fl. RPR 7: t. 27 f 2 (1960); Brummitt, op. cit. 62 (1971). Figure 11, p. 249.

Very similar to: *H. europaeum*, but

calyx lobes: slightly wider, broadly lanceolate;

corolla: to 3.5 mm, with smaller, infundibular limb;

stigma: subulate-conical, apex rounded, shortly hairy;

nutlets: 1.8-2 mm, tuberculate to tuberculate-rugose on one side only;

style: distinct, though rather short.

Fl.: 5-9. Fields, road-sides, sandy places, steppe, s.l.-1640 m.

Flora of Georgia 2001

Description: A greyish-green plant with appressed hairs, with an erect or ascending **stem**, 10-12 cm in height, usually branched from the base. **Leaves** are ovate, petiolate (having a stalk), with a wedge-shaped base and a sharpened tip; they have whitish pubescence (fine hair) underneath and bristly hairs on top. **Inflorescences** are solitary at the tips of the stem and branches, 3-8 cm long. The **calyx** (outer part of the flower) is thick, velvety, and bristly-hairy, bell-shaped, with elongated-lanceolate, erect **lobes** 2.5-3 mm long; it is almost equal to the corolla tube and enlarges somewhat during fruiting. The **corolla** is white, without appendages, 5-6 mm long, with rounded lobes and a tube that is hairy on the outside. The **stigma** is elongated-conical, positioned on the style or sessile (sitting directly), without a disk at the base. The **nutlets** (seeds) are almost 2 mm long, finely velvety, bare, or sparsely hairy. **Blooms** July-September (VII-IX).

(Gemini 2026.01.15)

⊙. მიტკეცილზეწვიანი მორუხო მწვანე მცენარეა, სწორმდგომი ან აღმავალი ღეროთი, 10–12 სმ სიმაღლის, ჩვეულებრივად ძირიდანვე დატოტვილი; ფოთლები კვერცხისებრია, ყუნწიანი, სოლისებრი ფუძით და წამახვილებული წვერით, ქვემოდან მოთეთრო შეხუსვით, ზემოდან ჯაგრისებრი ბეწვებით. ყვავილედეები მარტოულია ღეროსა და ტოტების კენწეროებზე, 3–8 სმ სიგრძის; ჯამი სქელი ხაოიანი და ჯაგრისებრი შეხუსვითაა, ზარისებრი, მოგრძო-ლანცეტა, აღმართული, 2,5–3 მმ სიგრძის ნაკვთებით, თითქმის ტოლია გვირგვინის მილის, ნაყოფობისას მეტ-ნაკლებად გადიდებული; გვირგვინი თეთრია, უგადანაცუნო, სიგრძით 5–6 მმ, მომრგვალო, ნაკვთებით, გარედან შეხუსვილი მილით; დინგი მოგრძო-კონუსური, მდებარე სვეტზე ანუ მჯდომარე, ფუძესთან უდისკო. კაკლუჭები თითქმის 2 მმ სიგრძისაა, წვრილხაოიანი, შიშველი ანუ მეჩხერბეწვიანი. VII–IX.

Transcription: Gemini 2026.01.15 unchecked

Atlas of the Aegean 2016

Heliotropium dolosum De Not. - Map 785

Very similar to *H. europaeum*, but differing in the following characters:

Calyx: teeth curving upwards around the developing **fruit**;

corolla: usually somewhat larger and said to be scented;

anthers: 1.2-1.4 mm;

stigmatic cone: rather broadly pyramidical, hairy, with rounded apex.

Note: Förther (1998: 191) Listed *H. dolosum* as a synonym of *H. europaeum*.

Flora Europaea 1972

4. *H. dolosum* De Not., Repert. Fl. Ligust. 284 (1844).

Flowers: scented.

Sepals: 0.8-1.1 mm wide, lanceolate, usually appressed-pubescent, curving upwards round the developing fruit, though often patent later.

Corolla: 3-5 mm.

Anthers: 1.1-1.5 mm.

Stigma: conical, hairy.

Fruit: glabrous, smooth.

Hab: Usually coastal.

Geo: C. & E. Mediterranean region and coast of Black Sea. Bu Cr Gr It Rm Rs (W) ?Si Tu.

Flora Iranica 1966

66. *H. dolosum* De Not., Repert. Fl. Ligust. 284 (1844). Syn.: *H. macrocarpum* Guss., Enum. Pl. Inar. 214, tab. 7, fig. 2 (1854). Typus: "In litore Liguriae occidentalis prope il Cereale legit hortulanus H. R. bot. genuensis".

Habit: very variable.

Stem: erect, usually very much branched in a spreading manner, with short more or less appressed bristles, and in addition with very few longer ones, slightly hispid.

Leaves: all rather long-petiolate, up to 45(50) mm long, 35 mm wide, but usually smaller, ovate-elliptic, either rather loosely covered on the **upper** surface with very short closely appressed bristles sometimes tuberculate at the base, green, or velvety-tomentose with longer soft appressed hairs, greyish, at the **apex** obtuse or acuminate, at the base attenuate into the petiole or truncate, with **nerves** impressed above, prominent beneath, **margin** entire, flat.

Inflorescences: simple or paired, rather densely scorpioid.

Calyces: sessile, 3 mm long, with 5 linear-lanceolate rather acute **lobes** with long more or less appressed **hairs**, greyish, persistent.

Corolla: scarcely one and a half times as long as the calyx, 3.5-4(4.5) mm long, with cylindrical **tube**, rather long-strigose outside, glabrous inside, **limb** two to three times shorter than the tube, with 5 suborbicular or subovate rounded **lobes** at first somewhat erect, then spreading, **imbricate** in aestivation.

Anthers: situated below the middle of the tube, gradually attenuate from base to apex, rather acute.

Stigma: elongate-conical pilose, much longer than the **style**.

Nutlets: scarcely 2 mm long, ovate, coarsely rugulose, glabrous.

Distr. gen.: Europa australis, Asia austro-occidentalis.

Note: For a long time, *H. dolosum* was considered a synonym of *H. ellipticum* Ledeb., with which it does indeed bear a strong resemblance. However, a more thorough study of specimens from the

classic ditio classica of both species should have shown that only plants from the wider area around Lake Caspia exhibit weakly rugulose or finely pitted nutlets, and that in these plants the calyx lobes always project in a star-like manner, as in *H. europaeum*. Typical *H. dolosum* has coarsely warted nutlets. Ledebour's descriptions leave no doubt in this regard. The structure of the calyx and the pubescence of the calyx lobes (see key) thus represent largely correlated, though not entirely reliable, characteristics. Unfortunately, the diagnosis by De notaris is not very clear, but that of the synonym *H. macrocarpum* Guss is. The attempt by Turrill, Kew Bull. 1929: 230ff. (1929), to make a distinction based on leaf shape is doomed to failure from the outset in the case of annual species that are highly variable in all vegetative characteristics.

Habitu valde variabilis. Caulis erectus, plerumque divaricato-ramosissimus, setulis brevibus appressiusculis, praeterea longioribus paucissimis hispidulus. Folia omnia longiuscule petiolata, usque ad 45(50) mm longa, 35 mm lata, sed plerumque minora, ovato-elliptica, aut setulis brevissimis in facie superiore interdum basi tuberculatis appressissimis laxiuscule obsita, viridia, aut pilis longioribus mollibus appressis velutino-tomentosa, canescentia, apice obtusa vel acuminata, basi in petiolum attenuata vel truncata, nervis supra impressis, subtus prominentibus, margine integro, plano. Inflorescentiae simplices vel binae, densiuscule. scorpioideae. Calyces sessiles, 3 mm longi, laciniis 5 lineari-lanceolatis acutiusculis appressiuscule longe pilosis canescentibus, persistentes. Corolla calyce vix sesquialongior, 3,5-4(4,5) mm longa, tubo cylindraceo, extra longiuscule strigoso, intus glabro, limbo tubo duplo triplove brevior, lobis 5 suborbicularibus vel subovatis rotundatis primo suberectis, dein patulis, aestivatione imbricatis. Antherae infra medium tubum sitae, a basi ad apicem gradatim attenuatae, acutiusculae. Stigma elongato-conicum pilosum, stylo multo longius. Nuculae vix 2 mm longae, ovatae, grosse rugulosae, glabrae. Distr. gen.: Europa australis, Asia austro-occidentalis. Lange Zeit wurde *H. dolosum* als Synonym von *H. ellipticum* Ledeb. betrachtet, mit dem es tatsächlich große Ähnlichkeit aufweist. Doch hätte das eingehendere Studium von Exemplaren aus der ditio classica beider Arten zeigen müssen, daß nur Pflanzen aus dem weiteren Umkreis des Kaspi-Sees schwach rugulose oder fein grubig punktierte Nüßchen aufweisen und daß bei ihnen die Fruchtkelchzipfel stets sternförmig absteigen wie bei *H. europaeum*. Typisches *H. dolosum* hat grobwarzige Nüßchen. Die Beschreibungen Ledebours lassen in dieser Hinsicht keine Zweifel offen. Die Ausbildung des Fruchtkelches und die Behaarung der Kelchzipfel (siehe Schlüssel) stellen damit weitgehend korrelierte, wenn auch nicht völlig verlässliche Charakteristika dar. Leider ist die Diagnose von De notaris nicht sehr eindeutig, wohl aber jene des Synonyms *H. macrocarpum* Guss. Der Versuch von Turrill, Kew Bull. 1929: 230ff. (1929), eine Trennung auf Grund der Blattform vorzunehmen, ist bei einjährigen, in allen vegetativen Merkmalen sehr variablen Arten von vornherein zum Scheitern verurteilt.

ellipticum (+ strictum)

PoWo Ledeb.: East European Russia, Iran, Kazakhstan, Kirgizstan, Krym, Pakistan, South European Russia, Tadzhikistan, Transcaucasus, Turkmenistan, Türkiye, Ukraine, Uzbekistan

- Not ([Fresen.](#)) [Gürke](#) > *Euploca procumbens* (Native N&S Americas; intro in N America, Cambodia, Samoa, Solomon Is., South China Sea, Taiwan)
- [Not R.Br.](#) > *Heliotropium aegyptiacum* (N.E. Africa incl. Egypt - Central African Republic, Chad, Djibouti, Egypt, Eritrea, Ethiopia, Kenya, Saudi Arabia, Socotra, Somalia, Sudan-South Sudan, Yemen)

strictum Ledeb. - **PoWo** [maps to](#) ellipticum Ledeb.

- Not strictum Ehrenb. ex Schweinf. - **PoWo** [maps to](#) strigosa (Willd.) Diane & Hilger (most of Africa, Arabian peninsula, Pakistan eastward)
- Not strictum Kunth - **PoWo** [maps to](#) humilis (L.) Feuillet (middle America)

Flora of Turkey 1978

9. *H. ellipticum* Ledeb. in Eichw., Pl. Casp.-Cauc fasc. 2, 10, t 4 (1831-1833) Syn: *H. eichwaldii* Steud., Nom. ed. 2, 1 744 (1840); *H. strictum* Ledeb, Fl Ross. 3:100 (1849); *H. litrorale* Steven in Bull. Soc. Nat. Mosc 24 565 (1851). Ic Fl. URSS 19. t. 8 f. 5 (1953) Figure 11, p. 249.

Similar to *H. dolosum*, but

calyx lobes: ovate, tapering from a rather wide base;

nutlets: longer, more than 2 mm, slightly reticulate-rugose, sometimes with tiny indistinct warts.

Fl.: 7-8. Dry stony slopes, 800-1200 m.

Geo: C. & E. Anatolia. A4 A5 A8 A9 B7 B10... Caucasia, N. Iran, Transcaspia, Pakistan. Ir.-Tur. element.

Note: Closely related to *H. lasiocarpum*.

Flora of Georgia 2001

Description ☺. A plant covered with more or less dense, short, and appressed **hairs**; the **stem** is

(10) 15-40 cm in height, solitary, usually widely branched from the base; **leaves** are elliptical or ovate, rhombic or rounded toward the base, blunt (obtuse) or somewhat blunt at the tip, rarely sharp (acute), with long petioles; the leaf **blade** is 15-35 mm long, greenish on top, grayish underneath or sometimes on both sides; lateral **veins** are impressed on top and prominent underneath. The **inflorescence** (cyme) is initially short and dense, later elongating and becoming more or less spreading, solitary or sometimes 2-4 together at the tips, one-sided, and two-rowed; **calyx** up to 2 mm long, grayish-pubescent with dense and spreading hairs, its segments are oblong and blunt, almost appressed to the nutlets during fruiting, but slightly star-shaped (stellate) and spreading after seeding; **corolla** white, 3-4 mm long, slightly exceeding the calyx, with teeth arranged between the curved lobes, the outer pubescent part is longer than the tube; **anthers** are narrow and lanceolate; **style** is very short and bare; stigma is oblong-conical or conical-lanceolate, angular, pubescent, split in two at the tip, and longer than the style. **Nutlets** are ovate, 1.5 mm long, wrinkled-finely tuberculate, bare or pubescent. **Flowering**: VII-IX (July-September).

(Gemini 2026.01.15)

○. ცოტად თუ ბევრად ხშირი, მოკლე და მიტკეცილი ბუჩქებით შეზუსტებული მცენარეა; ღერო (10) 15–40 სმ სიმაღლისაა, მარტოული, ჩვეულებრივ ძირიდანვე გაფარჩხულად დატოტვილი; ფოთოლი ელიფსური ან კვერცხისებრია, ძირისკენ რომბული ან მომრგვალებული, წვერზე ბლაგვი, მოზღაგვო ან იშვიათად მახვილი, გრძელყუნწიანი; მისი ფირფიტა 15–35 მმ სიგრძისაა, მომწვანო ზემოდან, მორუხო ქვემოდან ან ზოგჯერ ორივე მხარეზე; გვერდითი ძარღვები ზემოდან ჩაღრმავებულია, ქვემოდან ამოწეული. ყვავილედის (ხვეულის) ადრევე მოკლეა და მკვრივი, წაგრძელებული, მეტ-ნაკლებად ფარჩხალი, მარტოული ან ზოგჯერ 2–4 ერთად კენწეროვებზე, ცალმხრივი, ორმწკრივიანი; ჯამის სიგრძით 2 მმ-მდე, რუხად შეზუსტებული ხშირი და გაფარჩხული ბუჩქით, მისი ნაკვთები მოგრძოა, მოზღაგვო, ნაყოფობისას თითქმის კაკლუჭებზე მიტკეცილი, ხოლო ჩათესვის შემდეგ მცირედ ვარსკვლავისებრ გაფარჩხული; გვირგვინი თეთრი, სიგრძით 3–4 მმ-მდე, ჯამს ოდნავ აღემატება, გადანაღუნ ნაკვთებს შორის განწყობილი კბილებითაა, გარედან შეზუსტებული მილზე გრძელია; სამტკრეები ვიწრო შუბისებრია; სვეტი ძალიან მოკლეა, შიშველი; დინგი მოგრძო კონუსური ან კონუსურ-შუბისებრი, წახნაგოვანი, შეზუსტებული, წვერზე ორად გაყოფილი, სვეტზე უფრო გრძელი. კაკლუჭები კვერცხისებრია, 1,5 მმ სიგრძის, დანაოჭებულ-წვრილობორცვიანი, შიშველი ან შეზუსტებული. VII–IX.

Transcription: Gemini 2026.01.15 unchecked

Flora Iranica 1966

7. *H. ellipticum* Ledeb. in Eichw., Pl. Nov. It. Casp.-Cauc. 10, tab. 4 (1831-33) Syn.: *H. Eichwaldii* Steud., Nomencl. Bot., ed. 2, 1: 744 (1840-41). *H. littorale* SteV., Bull. Soc. Nat. Mosc. 24/1: 565 (1851). Typus: Turcomania: Ad litus orientale maris Caspii prope Krasnowodsk, Eichw., Le!

It differs from the very similar preceding species [dolosum] by the somewhat broader **calyx lobes**, gradually tapering from a broader base to a very sharp apex, spreading in a star-like manner after flowering and not incurved, **nutlets** usually somewhat longer than 2 mm, slightly reticulate-rugose or additionally more or less indistinctly warty.

Distr. gen.: Armenia, Azerbaijan, Turcomania, Persia, Pakistan.

Of the synonyms, only those I have personally verified and which have been applied to the field of Flora Iranica have been listed.

A praecedente simillimo differt calycis laciniis paulo latioribus, e basi latiore sensim attenuatis acutissimis, post florendum stellatim patentibus nec incurvatis, nuculis quam 2 mm plerumque sublongioribus, leviter reticulato-rugosis vel praeterea +- indistincte verruculosus. Distr. gen.: Armenia, Azerbaijan, Turcomania, Persia, Pakistan. Von den Synonymen wurden nur die von mir selbst überprüften angeführt, die auf das Gebiet der Flora Iranica Anwendung gefunden haben.

68. *H. strictum* Ledeb.

68. *H. strictum* Ledeb., Fl. Ross. 3: 100 (1849). Typus: Turcomania, Karelin, Le, W!

Differing from the very similar preceding species [ellipticum] by the somewhat broader ovate-lanceolate acute **calyx lobes**, by the **leaves** usually smaller than in both preceding species, often more densely velvety-tomentose, by the **nutlets** very minutely punctate in rows.

Distr. gen.: Turcomania, Persia boreali-orientalis.

The sculpture of the **nutlets**, dot-shaped pits, is not visible to the naked eye, which is why Ledebour describes it as smooth. However, it can be easily seen under a magnifying glass.

A praecedente simillimo differt calycis laciniis paulo latioribus ovato-lanceolatis, acutis, foliis quam in ambabus speciebus praecedentibus

plerumque minoribus saepe densius velutino-tomentosis, nulis minutissime seriatim punctatis. Distr. gen.: Turcomania, Persia boreali-orientalis. Die Skulptur der Nüßchen, punktförmige Griebchen, ist mit freiem Auge nicht zu erkennen, weshalb Ledebour sie als glatt bezeichnet. Unter der Lupe läßt sie sich aber leicht feststellen.

USSR 1974

[this account includes lasiocarpum, concluded as a variety]

17. *H. ellipticum* Ldb. in Eichw. Pl. casp.-cauc. (1831-1833) 6, 10; Ldb. Fl. Ross. III, 100; Kuzn. in Mat. Fl. Kavk. IV, 2, 88; M. Pop. in Tr. Bot. Sada, XLII, 220. - *H. strictum* Ldb. Fl. Ross. III (1849) 100. - *H. lasiocarpum* Fisch. et Mey. in Ind. Sem. Hort. Petrop. IV (1837) 38. - *H. eichwaldi* Steud. Nomencl. ed. 2, I (1840-1841) 744; DC. Prodr. IX, 535; Bge. Heliotr. 291-292; Boiss. Fl. or. IV, 131; C. B. Clarke in Hook. Fl. Brit. Ind. IV, 149; Kryl., Fl. Zap. Sib. IX, 2233. - *H. dolosum* Not. Repert. Fl. Ligust. (1844) 284. - *H. littorale* Stev. in Bull. Soc. Nat. Mosc. XXIV (1851) 565. - *H. macrocarpum* Guss. Enum. pl. Inar. (1854) 214, tab. 7. - *H. incanescens* Andr. Enum. pl. Podol. (1862) 116. - Ic.: Eichw. l. c. tab. 4. - Exs.: GRF, No. 1526.

Plant: Perennial;

stem: 10-40 cm high, herbaceous, robust, usually spreading-branching from base, with sturdy long branches and appressed downy hairs, canescent;

leaves: with petioles 1/2-2/3 length of blade, with ovate- oblong-oval, obtuse, 1.5-3.5 cm long blade, green above, canescent beneath with appressed hairs borne on tubercles, sometimes both surfaces canescent; lateral nerves depressed above, protruding beneath.

Scorpioid cymes: single or in pairs, sometimes 3-4, the lateral and terminal on distinct peduncles, secund, biseriate, short at first, compact, more or less elongating in fruit, looser, from 2 to 5 cm long;

calyx: gray, with short hairs, ca. 2 mm long, its lobes oblong, obtuse, hardly elongating, slightly spreading in fruit, not quite stellately diverging after abscission of fruit;

corolla: small, ca. 3 mm long, its tube downy outside, lobes of limb round-ovate, 1/2-1/3 length of tube, intermediate teeth small, more or less developed;

anthers: attached below middle of corolla tube;

stigma: conical to conical-subulate, much longer than glabrous style, slightly downy;

nutlets: ovoid, smooth or slightly rugose-tuberculate, dorsally inflated, glabrous or downy, 1.5 mm long. ["downy" would be lasiocarpum]

Fl: May-July. (Plate VIII, Figure 5.)

Hab: Stony slopes in semi-desert and semi-steppe belt, rarely in steppes, often as a weed in oases, river gravels, sands...

Note: This species may be regarded as a vicariant of *H. europaeum*. The characters mentioned in the Key readily distinguish them. Their distributions overlap over a vast area from Italy to the Caucasus; although hybrids sometimes occur here, the species remain distinguishable, unmixed. I believe that *H. lasiocarpum* Fisch. et Mey. should be put with *H. ellipticum*, as neither has a disjunct distribution area. *H. europaeum* L., has a race with downy nutlets (*H. tenuiflorum* Guss.), as has *H. ellipticum* (*H. lasiocarpum* Fisch. et Mey.). There is no need to apply a different nomenclature, as Kuznetsov has done (Mat. Fl. Kavk. IV, 2, 1913) on page 86 (*H. lasiocarpum* as a Species), and on page 95 (*H. tenuiflorum* as a variety). As delimited here the species includes var. *littorale* Kuzn. l. c. (1913) 90. A dull gray, more densely pubescent plant, nutlets glabrous, rarely slightly downy, scorpioid cymes loose, leaves usually acute, rarely obtuse. (This includes *H. littorale* Stev., *H. dolosum* Not., and *H. incanescens* Andr. - the last with faintly downy nutlets.) This race was first described from N. Italy (*H. dolosum* Not.) and by Steven from the Crimea (*H. littorale*); it is common in the Caucasus. I believe that *H. incanescens* Andr. belongs here, with its sparingly pubescent nutlets, different from those of *H. lasiocarpum*; in habit the plant resembles the Crimean *H. littorale*. *H. strictum* Ldb., which Ledebour himself distinguishes from his *H. ellipticum* by the acute leaves, is also very close to *H. littorale*; throughout Central Asia it grows alongside the type race and *H. lasiocarpum*.

Var. lasiocarpum (Fisch. et Mey.) M. Pop. l. c. 221

Nutlets densely spreading-downy, scorpioid **cymes** compact, **plant** canescent.

Geo: Caucasus: E. and S. Transc. (rarely); Centr. Asia: often in the north to 43° N. Gen. distr.: Iran., to India in the south. Predominantly a southern race of deserts. Like the preceding species it tends strongly to become a weed.

Note: The seeds contain the toxic alkaloid heliotropin; nutlets falling into bread cause poisoning. (See A. Ya. Butkov and D. D. Goloviznin, *Geliotrop opushennoplodnyi*, Tashkent, 1948.)

Flora Europaea 1972

2. H. ellipticum Ledeb. in Eichw., Pl. Nov. It. Casp.-Cauc. 10 (1831).

Like 1 [H. europaeum] but **corolla** 2.3-3.4 mm; **stigma** shorter and wider, usually more or less papillose; **fruit** glabrous. S. part of U.S.S.R. Rs (W, K, E).

Bunge 1969

CLAUDE

5a. Calyx lobes linear, corolla spreading-pubescent or glabrescent at base, stigma glabrous -- 6.

5b. Calyx lobes oblong-linear or ovate, corolla reverse-pubescent at base, stigma hispidulous -- 7.

6a. Nutlets glabrous (rarely very sparsely hispidulous), pitted-extremely rugose, calyx lobes very widely spreading in fruit, corolla limb spreading, intercalary lobes nearly absent, stigma subulate-conical, deeply unequally bifid -- H. europaeum.

6b. Nutlets densely hispidulous, rather smooth. Corolla limb erect, intercalary lobes rather large, stigma briefly conical, very briefly obtusely bilobed, calyx lobes connivent -- H. tenuiflorum [a Crimean variety according to USSR].

7a. Nutlets rather smooth, very finely shining-granulate, completely glabrous, calyx lobes appressed to fruit, spikes lax, intercalary lobes rather large -- H. eichwaldi [=ellipticum]

7b. Nutlets hispid-velvety, sparsely verrucose, calyx lobes oblong connivent, spikes condensed, intercalary lobes tooth-shaped -- H. lasiocarpum

5a. Calycis laciniae lineares, corolla basi patulo pubescens vel glabrescens, stigma glabrum -- 6.

5b. Calycis laciniae oblongo - lineares vel ovatae, cor. basi reverso-pubescens, stigma hispidulum -- 7.

6. Nuculae glabrae (raro pareiss. hispidulae) serobiculato-rugosissimae, caly- cis laciniae in fructu patentissimae, corollae limbo patulo, lacinii intercalaribus subnullis, stigma subulato-conicum profunde inaequaliter bifidum -- H. europaeum.

6b. Nuculae dense hispidulae laeviusculae. Corollae limbus erectus, laciniae intercalares majusculae, stigma breviter conicum, brevissime obtuse bilobum, calycis laciniae conniventes -- H. tenuiflorum.

7a. Nuculae laeviusculae tenuissime lucido-granulatae glaberrimae, cal. laciniae fructui adpressae, spicae laxae, lac interc. majusc. -- H. eichwaldi

7b. Nuculae hispido-velutinae parce verrucosae, calycis laciniae oblongae conniventes, spicae condensatae, lac. intercalares dentiformes -- H. lasiocarpum

lasiocarpum

PoWo: Afghanistan, China North-Central, China Southeast, East Aegean Is., Egypt, Gulf States, India, Iran, Iraq, Kazakhstan, Kirgizstan, Lebanon-Syria, Pakistan, Palestine, Saudi Arabia, Sinai, South European Russia, Tadzhikistan, Transcaucasus, Turkmenistan, Türkiye, Uzbekistan, West Himalaya, Xinjiang

tenuiflorum Guss. - PoWo maps to europaeum L. - the hairy nutlet form of europaeum

tenuiflorum (Boiss.) Guss. - PoWo maps to lasiocarpum Fisch. & C.A.Mey. - the hairy nutlet form of ellipticum i.e. with broad calyx lobes

Flora of Turkey 1978

Similar to *H. dolosum* but

Calyx: lobes lanceolate, with a rather wide base, **subpatent** in fruit, **tips** often slightly incurved;

Stigma: squat-conical, glabrous, **tip** bifid;

Nutlets: +- densely **hairy**, but otherwise sculptured similarly to *H. europaeum*, *H. dolosum* and *H. ellipticum*.

Fl.: 6-8. Steppe, sandy banks, fields, 50-1050 m.

Geo: A3 A4 B5 B7 B8 C4 C8 ... S.W. & C. Asia. Ir.-Tur. element.

Note: Closely related to *H. ellipticum*.

Flora Iranica 1966

69. *H. lasiocarpum* Fisch. & C. A. Mey., Ind. Sem. Hort. Petrop. 4: 38 (1837). Syn.: *H. tenuiflorum* BaE., Bull. Soc. Nat. Mosc. 42/2: 293 (1869), vix Guss. *H. Eichwaldi*; Steud. var. *lasiocarpum* (Fisch. & C. A. Mey.) C. B. Clarke in Hook., Fl. Brit. Ind. 4: 150 (1885). *H. europaeum* L. var. *tenuiflorum* Boiss., Fl. Or. 4: 130 (1879), quoad specimina citata. *H. ellipticum* Ledeb. var. *lasiocarpum* (Fisch. & C. A. Mey.) M. Pop., Act. Hort. Petrop. 42: 220 (1931). Typus: Penins. Dardscha.

Very **similar** to the preceding species [strictum which refers to ellipticum], with lanceolate **calyx lobes** dilated at the base, acute, somewhat spreading after flowering, with apices often somewhat incurved, **nutlet** sculpture as in *H. ellipticum* Ledeb., differing from all by the nutlets very densely covered with retrorse hairs.

Distr. gen.: Asia occidentalis et austro-occidentalis et centralis.

All Asian specimens identified as *H. europaeum* L. var. **tenuiflorum** (Guss.) Boiss. represent typical *H. lasiocarpum* Fisch. & C. A. Mey. It is clearly distinct from *H. europaeum* and its variety *tenuiflorum*, which I only know from the Ditio Classica, by its blunter, undivided scar [=**stigma**: narbe in German means scar or stigma].

Praecedentibus [strictum] simillimum calycis laciniis lanceolatis basi dilatatis acutis post florendum subpatentibus, apicibus +- saepe paulo incurvatis, nucularum sculptura ut in *H. elliptico* Ledeb., ab omnibus differt nuculis densissime retrorse pilosis. Distr. gen.: Asia occidentalis et austro-occidentalis et centralis. Alle asiatischen Belege, die als *H. europaeum* L. var. *tenuiflorum* (Guss.) Boiss. bestimmt waren, stellen typisches *H. lasiocarpum* Fisch. & C. A. Mey. dar. Es ist von *H. europaeum* und seiner mir nur aus der ditio classica bekannten Varietät *tenuiflorum* durch die stumpfere, ungeteilte Narbe deutlich verschieden.

Flora Europaea 1972

H. lasiocarpum Fischer & C. A. Meyer, Ind. Sem. Horti Petrop. 4: 38 (1838).

Like 1 [*europaeum*] but

stigma: shorter and wider, papillose or hairy;

fruit: densely hairy.

Geo: S.E. Russia, W. Kazakhstan. Rs (E). (S. W. Asia.)

Atlas of the Aegean 2016

Heliotropium lasiocarpum Fisch. & C. A. Mey.

Very similar to *H. europaeum*, but differing in the following characters:

Cymes: dense and slender;

stigmatic cone: short and wide;

nutlets: densely hairy.

Flora of China

6. *Heliotropium lasiocarpum* Fischer & C. A. Meyer, Index Sem. Hort. Petrop. 4: 38. 1837. *Heliotropium eichwaldii* Steudel var. *lasiocarpum* (Fischer & C. A. Meyer) C. B. Clarke; *H. ellipticum* Ledebour var. *lasiocarpum* (Fischer & C. A. Meyer) Popov; *H. europaeum* var. *lasiocarpum* (Fischer & C. A. Meyer) Kazmi.

Plant: Herbs annual, ca. 40 cm tall.

Stems: erect, sometimes woody at base, low **branched**, densely spreading or curved, white **pubescent** or sometimes hirtellous.

Petiole: 1-3 cm, densely pubescent or hirtellous;

leaf blade: obovate to elliptic-ovate, 2-6 × 1.5-3.5 cm, white pubescent or hirtellous, **base** widely cuneate to rounded, **margin** entire, apex obtuse; **lateral veins** 3 or 4 pairs, usually densely pubescent.

Cymes: terminal and axillary, scorpioid, 8-15 cm; **branches** usually paired, rarely ternate, ebracteate.

Flowers: sessile.

Calyx: parted nearly to base; **lobes** lanceolate, 3-3.5 × 0.5-1 mm, densely pubescent.

Corolla: white, tubular-campanulate, 4-4.5 mm, pubescent outside, glabrous inside;

lobes: rounded, 1-1.5 mm wide, with an erect or spreading **fold** between lobes.

Anthers: sessile, 1-1.2 mm, inserted ca. 1 mm above base, apex abruptly attenuate.

Ovary: globose, ca. 1 mm in diam., glabrous.

Style: extremely short or obscure;

stigma: ringlike, ca. 5 mm wide, sterile upper portion ca. 1 mm, **2-cleft**.

Fruit: 2-2.5 mm in diam., dividing into 4 1-seeded **mericarps**;

mericarps: ovate, densely short **strigose**, sparsely tuberculate.

Fl. and fr.: Jun.

Hab: Deserts at low elevations, gravelly river marshes, meadows. N Henan, SW Shanxi, N Xinjiang [India, Kashmir, Kazakhstan, Kyrgyzstan, Pakistan, Russia, Tajikistan, Turkmenistan, Uzbekistan; SW Asia].

Flora of Pakistan

17a. *Heliotropium europaeum* var. *lasiocarpum* (F. & M.) Kazmi in J. Arn. Arb. 51:176. 1970. *Heliotropium eichwaldii* var. *lasiocarpum* (Fisch. & Mey.) Clarke; *Heliotropium ellipticum* var. *lasiocarpum* (Fisch. & Mey.) M. Popov; *Heliotropium lasiocarpum* Fisch. & Mey.

Plant: Annual, 50 cm or more tall, branched.

Branches: green or greyish-green, dense white hairs up to 1 mm long and arising from a bulbous base.

Leaves: petiolate; **petiole** up to 4.5 cm long.

Lamina: 15-60 (-75) × 10-40 mm, elliptic-ovate to obovate, **hairy** on both surfaces; hairs white, appressed, arising from bulb base, **nerves** impressed on upper surface.

Inflorescence: terminal, 3-14 cm long with close set **biseriate** flowers.

Calyx: sessile, persistent, 2.5-3.0 mm long, **lobes** c. 2 mm long, linear, hairy on the outside, glabrous within; **throat** constricted.

Corolla: **lobes** ± orbicular to oblong, c. 1.2 mm long, **sinuses** often with append.

Anthers: c. 1.1 mm long, elongated, **branched** at base, apex acutish, **attached** c. 0.7 mm from the corolla tube base.

Stigma: basally 2-fid.

Nutlets: 1.8-2 mm long, ovoid, **retrorsely** dense pilose and minutely verrucose to rugulose on back, brown.

Fl. Per.: April, later at higher elevations.

Type: 'Penin. Dardscha', Coll. Ign. (LE! iso. K).

Distribution: Trans Jordan, Syria, Iraq, Iran, Russia, Afghanistan, Pakistan, India.

Note: Differing from the type variety [europaeum] in **corolla tube constricted** at throat, **stigmatic** appendage not deeply bilobed and hairy nutlets. The taxon is variable throughout its geographical range in leaf size and length of inflorescence. The sinuses between corolla lobes are sometimes appendaged (Sultanul Abedin & A. Hussain 9634; Harsukh 15406). Differs from the type variety in the corolla tube which is constricted at the throat, the stigma which is obscurely 2-fid and densely pilose (not glabrous or subglabrous) nutlets. Widely distributed from sea level to 1829 m.

USSR 1974

[Placed under *H. ellipticum*]

Var. lasiocarpum (Fisch. et Mey.) M. Pop. l. c. 221

[*H. lasiocarpum* Fisch. et Mey, l. c.; Ldb. Fl. Ross. III, 100; Boiss. Fl. or. IV, 131; Kuzn., Mat. Fl. Kavk. IV, 2, 86. - *H. eichwaldi* var. *lasiocarpum* C.B. Clarke in Hook. Fl. Brit. Ind. IV (1885) 156].

Nutlets densely spreading-downy, scorpioid **cymes** compact, **plant** canescent.

Geo: Caucasus: E. and S. Transc. (rarely); Centr. Asia: often in the north to 43° N. Gen. distr.: Iran., to India in the south. Predominantly a southern race of deserts. Like the preceding species it tends strongly to become a weed.

Note: The seeds contain the toxic alkaloid heliotropin; nutlets falling into bread cause poisoning. (See A. Ya. Butkov and D. D. Goloviznin, *Geliotrop opushennoplodnyi*, Tashkent, 1948.)

Bunge 1969

CLAUDE

5a. Calyx lobes linear, corolla spreading-pubescent or glabrescent at base, stigma glabrous -- 6.

5b. **Calyx** lobes oblong-linear or ovate, **corolla** reverse-pubescent at base, **stigma** hispidulous -- 7.

6a. Nutlets glabrous (rarely very sparsely hispidulous), pitted-extremely rugose, calyx lobes very widely spreading in fruit, corolla limb spreading, intercalary lobes nearly absent, stigma subulate-conical, deeply unequally bifid -- *H. europaeum*.

6b. Nutlets densely hispidulous, rather smooth. Corolla limb erect, intercalary lobes rather large, stigma briefly conical, very briefly obtusely bilobed, calyx lobes connivent -- *H. tenuiflorum* [a Crimean variety according to USSR].

7a. Nutlets rather smooth, very finely shining-granulate, completely glabrous, calyx lobes appressed to fruit, spikes lax, intercalary lobes rather large -- *H. eichwaldi* [=ellipticum]

7b. **Nutlets** hispid-velvety, sparsely verrucose, **calyx** lobes oblong connivent, **spikes** condensed, intercalary lobes tooth-shaped -- *H. lasiocarpum*

5a. Calycis laciniae lineares, corolla basi patulo pubescens vel glabrescens, stigma glabrum -- 6.

5b. Calycis laciniae oblongo - lineares vel ovatae, cor. basi reverso-pubescens, stigma hispidulum -- 7.

6. Nuculae glabrae (raro pareiss. hispidulae) serobiculato-rugosissimae, caly- cis laciniae in fructu patentissimae, corollae limbo patulo, lacinii intercalariibus subnullis, stigma subulato-conicum profunde inaequaliter bifidum -- *H. europaeum*.

6b. Nuculae dense hispidulae laeviusculae. Corollae limbus erectus, laciniae intercalares majusculae, stigma breviter conicum, brevissime obtuse bilobum, calycis laciniae conniventes -- *H. tenuiflorum*.

7a. Nuculae laeviusculae tenuissime lucido-granulatae glaberrimae, cal. laciniae fructui adpressae, spicae laxae, lac interc. majusc. -- *H. eichwaldi*

7b. Nuculae hispido-velutinae parce verrucosae, calycis laciniae oblongae conniventes, spicae condensatae, lac. intercalares dentiformes -- *H. lasiocarpum*

tenuiflorum

7. *H. tenuiflorum* (Guss. fl. sic. p. 205.?) Hohenacker in pl. Kotsch. alepp. kurd. moss. n. 659! Syn. *H. europaeum* B *tenuiflorum* Boiss. in Kotsch. pl. cilic. kurd. n. 451! Hab. in Sicilia? (conf. supra n. 6.), in Mesopotamia prope Mossul (Kotschy!) in Kurdistan prope Musch in collibus aridis alt. 4340! s. m. (Kotschy!) v. s. sp. fl. et fr.

It **differs** abundantly from *H. europaeum* by the broader **calyx lobes** erect in fruit, the erect-spreading **corolla limb**, all the **intercalary lobes** developed and rather large, the very shortly bilobed **stigma** (not subulate-elongate deeply unequally bifid), and the sparsely warty velvety-

hispid **nutlets**, among other characters. (Claude 2025.12.31)

Calycis laciniis latioribus in fructu erectis, corollae limbo erecto patulo, laciniis intercalaribus omnibus evolutis majusculis, stigmatе brevissime bilobo, nec subulato-producto profunde inaequaliter bifido, & nuculis parce verrucosis velutino-hispidis, praeter alia, abunde ab H. europaeo differt.

Flora of British India 1885

as *H. eichwaldi* [ellipticum] var. *lasiocarpum*

nuts hispid-silky sparingly rugose.

suaveolens

PoWo: species, no overlap as follows -

ssp suaveolens: **Native**: Albania, Belarus, Greece, Iran, Iraq, Krym, NW. Balkan Pen., Palestine, South European Russia, Transcaucasus, Türkiye, Türkiye-in-Europe, Ukraine

ssp boccone*i*: **Native**: Italy, Sicilia. **Intro**: Germany

Flora of Turkey 1978

12. *H. suaveolens* Bieb., Fl. Taur.-Cauc. 3:116 (1819). Syn: *H. intermedium* Andr. in Eichw., Skizze 140 (1830); *H. commutatum* C. Koch in Linnaea 22:627 (1849); *H. inodorum* Szovits ex Stev in Bull. Soc. Nat. Mosc. 24:563 (1851). Ic: Reichb., Ic. Pl. Crit. 4° t. 379 (1826); Fl. RPR 7: t. 27 f. 5 (1960). Figure 11.

Plant: Annual, covered for the most part with short, adpressed hairs, sometimes on tiny tubercles.

Stems: erect, branched from base.

Leaves: ovate, to 35 mm, obtuse to subacute.

Cymes: very short and dense at first, becoming laxer and elongated.

Calyx: lobes 2.5-3 mm in flower, to 4 mm in fruit, linear-lanceolate, erect.

Corolla: 4-5 mm diam., limb rotate, hairy.

Stigma: subsessile, shortly conical, acute, glabrous.

Nutlets: ovoid, verrucose, glabrous.

Fl.: 6-10. Fallow fields, dry disturbed slopes, nr s.l.-1300 m.

Flora Europaea 1972

5. *H. suaveolens* Bieb., Fl. Taur.-Cauc. 3: 116 (1819).

Plant: Annual; stems up to 40 cm, erect or ascending, more or less appressed-pubescent.

Leaves: up to 5.5 x 2.8 cm, ovate to elliptical, cuneate to rounded at the base, rounded to subacute at the apex, appressed-pubescent; petiole up to 3.5 cm.

Flowers: scented.

Sepals: 2-3.5 mm, linear-oblong, with dense, patent hairs.

Corolla: 4-6.5 mm; limb (3.5)4.5-8 mm in diameter, white.

Anthers: inserted near base of corolla-tube.

Stigma: 0.1-0.5 mm, shortly conical or hemispherical, entire or shallowly 2- to 4-lobed, about as long as wide, usually pubescent or papillose.

Fruit: splitting into 4 nutlets.

Geo: S.E. Europe, extending to S. Italy and Sicilia. Bu ?Co ?Cr Gr It Rm Rs (W, K, E) Si Tu.

(a) **Subsp. suaveolens:** Ripe fruit 1.5-2 mm, light brown, usually hairy. S.E. Europe. [!"usually hairy" contradicted by the others]

(b) **Subsp. bocconeii** (Guss.) Brummitt, Bot. Jour. Linn. Soc. 64: 67 (1971) (H. bocconeii Guss.): Ripe fruit 1-1.7 mm, blackish-brown, usually glabrous. Italy and Sicilia, perhaps Corse.

Iranica 1994

33. *Heliotropium suaveolens* M.Bieb., Fl. taur.-cauc. 3: 116. 1819 = *H. europaeum* L. var. *suaveolens* (M.Bieb.) Fiori & Paol., Fl. anal. Ital. 2: 382. 1902 = *H. europaeum* subsp. *suaveolens* (M.Bieb.) Litard. in Briq., Prodr. fl. Corse 3(2): 88. 1955. Holotype: in aceruis circa templum oppido transbosphorani Taman, 1818, Steven (LE!; Isotypes: B!, H 1611474!, K!). = *H. confertiflorum* Boiss. & Noë in Boiss., Diagn. pl. orient., 2.ser., 3: 132. 1856 = *H. boissieri* Gürke in Engl. & Prantl, Nat. Pflanzenfam. 4(3a): 96. 1893 nom. illegit. Holotype: in subalpinis pr. Haneky [Khanaqin, 9.1851], Noë (G-BOIS!; Isotypes: GOET!, LE, P!). Fig.: plate 14 d, page 261.

Plant: Annual, 10-60 cm high, erect, **stem** usually branched; indument of tuberculate and \pm hollow and sometimes glandulose **hairs**, up to 1.5 mm long.

Leaves: 1-4 cm long, 0.8-3 cm broad, ovate to elliptic, acute or obtuse, at base \pm truncate, **margin** entire or slightly sinuate, **petiole** up to 2.5 cm long; **upper** side subappressed villose, **nerves** slightly impressed, **lower** side densely covered with tuberculate patent hairs, **nerves** prominent.

Inflorescence: lateral and terminal, simple or branched; biseriate **cymes** 2-10(20) cm long with 20-50 flowers.

Calyx: sessile, persistent after dropping of nutlets;

calyx lobes: free to base, linear-lanceolate, 2-3 mm long, 0.3-0.6 mm broad, acute or obtuse, on both sides villose, inside only in upper part.

Corolla: 4-7 mm long, tube 2-3 mm long, **outside** with empty tuberculate and sometimes glandulose hairs, **inside** glabrous;

corolla lobes: 1.5-3 mm broad, broadly rotundate, mainly entire, rarely obscurely crenulate, without distinct **intercalary teeth**.

Anthers: 0.8-1 mm long, **inserted** 0.8-1 mm above corolla base.

Stigma: 0.4-0.6(0.7) mm long, shortly conical to cape-shape, pilose, apex bilobed.

Style: only 0.1-0.2 mm long, glabrous, usually hidden by **stigma**.

Nutlets: 1.2-1.5 x 0.9-1.2 mm large, ovate, rugose, glabrous.

General distribution: Balkan, Armenistan, Azerbaijan, Turkey, Iraq and Iran.

Geo: *H. suaveolens* is distributed mainly in Mediterranean area and penetrates into eastern Irano-Turanian region as well.

Note: Morphological variation of this species in Europe was discussed by Brummitt (1971). *H. confertiflorum* which was described from Iraq near the border to Iran has no reasonable differences from *H. suaveolens*. GÜRKE (1893) has named it incorrectly *H. boissieri* Gurke because he probably missed that the spelling of *H. confertifolium* (Torr.) A.Gray for a Mexican species is little different.

Flora Iranica 1966

73. *H. suaveolens* M. B., Fl. Taur.-Cauc., 3: 116 (1819). Syn. *H. commutatum* C. KOCH, Linnaea 12: 627 (1849) p. p. *H. intermedium* ANDRZ. in EICHW., Skizze 140 (1830). *H. odorum* Szov. ex STEV., Bull. Soc. Nat. Mosc. 24/1: 563 (1851). Typus: Kaukasus: Derbent, STEV.

Plant: Annual, of medium height.

Indumentum: for the most part hispid with very short, white-tuberculate-based, appressed bristles.

Stem: erect, branched from the base.

Leaves: rather long-petiolate, up to 35 mm long, 25-28 mm wide, ovate, obtuse or acuminate, truncate at the base, with nerves impressed above and prominent beneath, margin entire, flat.

Inflorescences: mostly 2-5 crowded together, at first very dense, rather short, subcorymbose, finally elongated, rather lax.

Axis of inflorescence and calyces: spreading villous-tomentose with very dense, rather long hairs.

Calyces: subsessile, 2.5-3 (-3.5) mm long, enlarging to 4 mm under the fruit, with linear-lanceolate or linear-oblong, obtuse lobes, finally erect, persistent.

Corolla: 4-5 mm long, hypocrateriform, with tube about equal to the calyx, as the throat plicate, hairy outside, glabrous inside, limb at first campanulate, then rotate, 5(-6) mm in diameter, with 5 semi-orbicular or subovate lobes, broadly rounded, imbricate in aestivation.

Anthers: inserted below the middle of the tube, oblong.

Stigma: shortly acutely conical, glabrous, with very short glabrous style.

Nutlets: ovate, verrucose, glabrous.

Distr. gen.: Europa, Rossia, Caucasus, Anatolia, Persia.

Annuum, altitudine mediocri. Indumentum pro maxima parte e setulis brevissimis basi albo-tuberculatis appressis hispidulum. Caulis erectus a basi ramosus. Folia longiuscule petiolata, usque ad 35 mm longa, 25-28 mm lata, ovata, obtusa vel acuminata, basi truncata, nervis supra impressis subtus prominulis, margine integro, plano. Inflorescentiae plerumque 2-5 confertae, primo densissimae, breviusculae, subcorymbosae, demum elongatae, laxiusculae. Axis inflorescentiae et calyces patule villosito-tomentosae pilis longiusculis densissimis. Calyces subsessiles, 2,5-3 (-3,5) mm longi, sub fructu usque ad 4 mm accrescentes, laciniis lineari-lanceolatis vel lineari-oblongis, obtusis, demum erectis, persistentes. Corolla 4-5 mm longa, hypocrateriformis, tubo calyce subaequilongus, ut faux plicato, extra piloso, intus glabro, limbo primo campanulato, dein rotato, 5(-6) mm diam., lobis 5 semiorbicularibus vel subovatis, late rotundatis, aestivatione imbricatis. Antherae sub medio tubo insertae, oblongae. Stigma breviter acute conicum, glabrum, stylo brevissimo, glabro. Nuculae ovatae, verrucosae, glabrae...

Transcription: AI & OCR compared with winmerge and measurements checked

USSR 1974

14. *H. suaveolens* M. B. Fl. taur.-cauc. III (1819) 116; DC. Prodr. IX, 535; Ldb. Fl. Ross. III, 99; Boiss. Fl. or. IV, 133; Shmal'g., Fl. II, 221; Kuzn. in Mat. Fl. Kavk. IV, 2 (1913) 97; Grossg., Fl. Kavk. III, 247. - *H. europaeum* M. B. Fl. taur.-cauc. I (1808) 118. - *H. commutatum* C. Koch in Linnaea, XXII (1849) 627, p.p. - *H. intermedium* Andr. in Eichw. Skizze (1830) 140; DC. Prodr. IX, 535; Stev. in Bull. Soc. Nat. Mosc. XXIV (1851) 563. - *H. odorum* Szov. ex Stev. l. c. (1851) 567. - l.c.: Rchb. Pl. crit. IV (1826) tab. 379.

Plant: Perennial; stem 10-30(40) cm high, erect, simple only in small, weak individuals, usually spreading-branching at base, with long ascending branches, short-appressed-gray-downy;

leaves: with long thin petioles and oval, oblong or ovate blades, cuneate at base, rather large, 2-4 cm long, rarely small, 1-3 cm long, rather thin, greenish, generally rather mesophyllous, acute or obtuse, the nerves slightly protruding below, faintly depressed above, both surfaces shortly and sparsely downy.

Scorpioid cymes: usually paired at ends of branches, sometimes single, or in groups of 3, on short, glabrous peduncle or nearly lateral in axil of upper leaf, rather compact, biseriate, secund, leafless, slightly loose in fruit, 2-5 cm long;

calyx: sessile, gray-downy-villous, ca. 2 mm long, its lobes lanceolate-linear, acute, nearly not elongating in fruit, not quite stellately spreading;

corolla: white, medium-sized, its tube strongly downy, usually faceted, twice as long as calyx, ca. 7 mm across, plano-calyciform limb with oblong or ovate, rounded lobes, undulant at apex;

intermediate teeth: lacking;

anthers: oblong, 1 mm long, at middle of corolla tube;

style: very short;

stigma: wide, the basal disk with markedly protruding margins, its apex short, conical, thick, downy; stigma generally pileiform (character of section Piliostylis Stev. too insignificant to justify its separation);

nutlets: small, 1.5 mm high, ovoid, pitted-tuberculate, but less deeply so than in *H. europaeum*, in contrast to it more thinly downy; gynobase very low-conical.

Flw: May-July. (Plate VIII, Figure 6.)

Hab: Stony slopes in mountainous semi-desert and steppe belt, sands, pastures, weedy places, etc.

Geo: European part: Bes., M. Dnp., Bl., L. V., L. Don, Crim.; Caucasus: everywhere except W. Transcaucasia. Gen. distr.: Bal.-As. Min., Iran. (N.). Described from Taman. Type in Leningrad.

Note: The type specimen from Taman in the NW Caucasus is a very large plant with large leaves, large flowers and glabrous nutlets. *H. odorum* Szov. described from Armenia represents the S. Transcaucasian race with small, rounded-ovate, green leaves, looser cymes, downy nutlets and smaller flowers. *H. intermedium* Andr., described from Kherson and S. Podolia, is the race of the Dnieper-Dniester steppe with narrow, oblong, acute leaves, small flowers, corolla limb 4 mm across, and downy nutlets. *H. commutatum* C. Koch - according to Koch native to Georgia and Shirvan - is most closely allied to *H. odorum* Szov. It is usually mistaken for *H. europaeum* but its nutlets are twice as large. This is a pertinent character for *H. odorum* Szov., hence *H. commutatum* may be a race of *H. europaeum* L.

Transcription: Gemini and PDF24 compared with winmerge with the original

Syria-Palestine Post 1933

Key Section: Annuals - Corolla-lobes imbricated in bud - Calyx persistent after the shedding of the fruit. Nutlets 4. - Stigma tapering from a conical base.

3. *H. suaveolens* M.B. (1819) ☉ [Annual] Fragrant H. (iv. 133; H. ii. 315)

Plant: 30 to 60 cm, pale-green, beset with very short hairs, minutely tubercled at the base, stem erect, dichotomously branched.

Leaves: ovate, obtuse, petioled.

Spikes: in 2's to 4's, densely flowered;

lobes: of the hirsute calyx linear, somewhat shorter than the tube of the corolla.

Corolla: white, hirsute;

stigma: with a very short style;

nutlets: warty, smooth.

Flw: May-Sept.

Hab: Hills and stony places.

hirsutissimum

PoWo Weber: Greece round to Libya - Cyprus, East Aegean Is., Egypt, Greece, Kriti, Lebanon-Syria, Libya, Palestine, Türkiye, Türkiye-in-Europe

• Not **Vatke** > *Heliotropium steudneri* Vatke subsp. *steudneri* - Africa (but not Med. edge countries), S. edge Arian Peninsula - Angola, Botswana, Cape Provinces, Djibouti, Eritrea, Eswatini, Ethiopia, Free State, Kenya, KwaZulu-Natal, Mozambique, Namibia, Northern Provinces, Oman, Somalia, Sudan-South Sudan, Tanzania, Yemen, Zimbabwe

Flora of Turkey 1978

11. *H. hirsutissimum* Grauer, Decad. Pl. Min. Cogn. 1 (1784). Syn. *H. villosum* Willd., Sp. Pl. 741 (1797). Ic: Brummitt, loc. cit. p. 62 (1971). Figure 11, p. 249.

Plant: Annual, covered throughout with ± patent hairs, especially on calyx.

Stem: divaricately branched.

Leaves: ovate to ovate-lanceolate, obtuse, rarely subacute, usually 15-30 cm, rarely longer, distinctly petiolate.

Cymes: many-flowered, very dense at first, becoming laxer and elongated later.

Calyx: sessile, 3.5 mm, lobes narrowly lanceolate, acute, ± erecto-patent in fruit.

Corolla: 5 mm, limb distinct, rotate, 5-6 mm diam.

Stigma: squat, cushion-shaped, style c. 0.5 mm.

Nutlets: glabrous, densely tuberculate.

Fl.: 5-10. Fields and field margins, waste ground, gravel banks, s.l.-2200 m.

Flora Aegean 2015

Heliotropium hirsutissimum Grauer - Map 787

Plant: Moderately branched annual, 20-60 cm; whole plant greyish-green from a mixture of short, subappressed hairs and long, patent hairs, the latter especially above.

Leaves: petiolate; blade rather small (usually 15-25 mm), elliptic-ovate.

Flowers: subsessile, in dense, scorpioid cymes.

Calyx: lobed almost to the base.

Corolla: tube puberulent outside; **limb** 5-8 mm in diam., white with yellow centre and scales in throat.

Nutlets: 4, tuberculate.

Stigmatic cone: depressed-pulvinate.

Flora Europaea 1972

7. *H. hirsutissimum* Grauer, Pl. Min. Cogn. Dec. 1 (1784).

Like 5 [*H. suaveolens*] in habit and vegetative characters but

Hairs: stems and petioles with dense, greyish or yellowish, patent hairs c. 1 mm.

Flowers: scented.

Sepals: 3-4 mm, linear-oblong, with dense, patent hairs.

Corolla: 5-8 mm; limb 4-8 mm in diameter, white, with 5 scales in the throat.

Anthers: inserted near base of corolla-tube.

Stigma: shallowly hemispherical, wider than long, pubescent.

Fruit: splitting into 4 nutlets, glabrous.

Geo: C. & S. Greece, S. Aegean region. Cr Gr.

Syria-Palestine Post 1933

Key Section: **Annuals.** - Corolla-lobes **imbricated** in bud. - **Calyx** persistent after the shedding of the fruit. **Nutlets** 4. - **Stigma** cupshaped (depressed-conical). - **Limb** of corolla 5-lobed.

5. *H. villosum* Willd. (1798; *H. hirsutissimum* Grauer) © [Annual] Villous *H.* (iv. 137; *H.* ii. 314; *M.* 786; Löw, i. 292, 297).

Plant: 30 to 40 cm, tomentose with dense, short, appressed wool, intermixed with longer, spreading hairs.

Leaves: petioled ovate, obtuse;

corolla: glabrous or hirsute within, ribs ending in a tooth below the throat;

anthers: adnate below middle of tube stigma nearly sessile, much broader than long.

Flw: July-Sept. Fields and roadsides...

b. brevilimbum Boiss. (1875). - Limb of the corolla smaller.

thermophilum

PoWo: Türkiye

PDF thermophilum 2008

Plant: Herbaceous annual or perennial covered with 1-1.5 mm long, predominantly spreading, nonglandular unicellular **hairs** and shorter, adpressed or subpatent, stiff, nonglandular unicellular hairs bulbous at the base.

Upper part of plant: especially calyces, also with long and short, **glandular**, multicellular hairs.

Stem: erect to ascending, divaricately **branched** above, 25-50 cm, 6 mm diameter at base.

Leaves: alternate, exstipulate, reticulately **veined**, dark green, ovate or broadly lanceolate, rarely elliptic, 1.3-7.5 x 0.6-3.7 cm, obtuse to acute, asymmetrically cuneate at **base**, entire or irregularly crenate-sinuate, usually with a distinct **petiole** 0.4-4 cm long.

Inflorescence: a lax, ebracteate, scorpioid cyme, up to 40-**flowered**.

Calyx: 4-5 mm, sessile or with short **pedicels** to 2 mm;

tube: short (1-2 mm); **lobes** lanceolate, acute, persistent, not enclosing **nutlets**, ± erecto-patent in fruit.

Corolla: golden-yellow, darker at **throat**, hypocrateriform, 3.2-6 mm long; **limb** imbricate and

overlapping in bud, rotate, 6-9 mm diameter in vivo, densely covered on the outer surface with papillae and unicellular hairs;

intercalary lobes: absent between **primary** corolla lobes;

tube: plicate, with 5 hairy **faucal scales**.

Anthers: included, inserted near base of corolla **tube**, oblong-ovoid to lanceolate, ~0.8 mm; **filaments** very short.

Style: terminal, free between nutlets, ~0.3-0.5 mm;

stigma: depressed-pulvinate, ~1 mm diameter and broader than long, with spreading **hairs**.

Nutlets: 4, ~1.7 x 0.6 mm, glabrous, tuberculate-verrucose dorsally, alveolate ventrally.

Flowering and fruiting: almost throughout the year, from late January to December, particularly well in late August.

Etymology: The new taxon is named after its ecological preferences.

Distribution: So far known only from one locality with an area of less than 10 km² near Buharkent in the province of **Aydin** in SW Anatolia (Fig. 2). Several populations were found, most of them with 5-10 individuals, but some populations had up to 40 plants. *H. thermophilum* is considered rare; however, no evidence exists that it is threatened or critically endangered although its numbers are low (IUCN, 2001).

Habitat: [text describes a geothermal valley 55-65°C, 220m, 2004.08.15, with unusual mineral levels, where few other plants survive]

Key features: *H. thermophilum* differs from the annual *H. hirsutissimum* in a number of characters. The corolla is larger (6-9 mm diameter), and completely golden-yellow. In *H. hirsutissimum* the corolla is smaller (4-6 mm diameter), white or dirty-white in color and pale yellow only at the throat and sometimes in the tube. The faucal scales in *H. thermophilum* are nearly twice as large (Fig. 3(E)) and very hairy. The inflorescence is somewhat lax and does not elongate greatly in fruit. The leaves are distinctly dark green, but in *H. hirsutissimum* they are greyish-green.

H. suaveolens M. Bieb., which has sometimes been misidentified as *H. hirsutissimum*, differs in having glabrous stigmas and corollas lacking faucal scales.

2.1. Key to the Two Species

***H. thermophilum*:** Annual or perennial; corolla 6-9 mm in diameter, golden-yellow throughout; faucal scales 1.6-1.7 mm long; leaves dark green; inflorescence lax; occurring in thermal habitat.

***H. hirsutissimum*:** Annual; corolla 4-6 mm in diameter, white or dirty-white, yellow only at throat and tube; faucal scales less than 1 mm long; leaves greyish-green; inflorescence dense; not occurring in thermal habitat.

supinum

PoWo: Native: S. Europe, most of Africa, Turkey, Middle-East and eastwards - Albania, Algeria, Angola, Balears, Bangladesh, Benin, Botswana, Bulgaria, Cameroon, Canary Is., Cape Provinces, Central African Republic, Chad, Corse, Cyprus, Djibouti, East Aegean Is., Egypt, Eritrea, Ethiopia, France, Greece, Hungary, India, Iran, Iraq, Italy, Kazakhstan, Kenya, Kriti, Lebanon-Syria, Libya, Mali, Mauritania, Morocco, Mozambique, Myanmar, Namibia, Niger, Nigeria, Northern Provinces, NW. Balkan Pen., Pakistan, Palestine, Portugal, Romania, Sardegna, Senegal, Sicilia, Sinai, Somalia, Spain, Sri Lanka, Sudan-South Sudan, Tadzhikistan, Tanzania, Transcaucasus, Tunisia, Turkmenistan, Türkiye, Uganda, Uzbekistan, Zambia, Zimbabwe. **Intro:** Germany, Pennsylvania

Flora of Turkey 1978

13. *H. supinum* L., Sp. Pl. 130 (1753). Ic: Reichb., Ic. Fl. Germ 18 t. 1294 (1858); Coste, Fl. Fr. 2:608, t. 2616 (1903). Figure 11, p 249

Plant: Annual, stems numerous, prostrate, scarcely branched, patent-hairy.

Leaves: long-petiolate, to 18 mm, lamina ovate, obovate or ovate-lanceolate, strigulose above, densely tomentose beneath.

Cymes: several, crowded, very short and dense.

Calyx: sessile, 2-2.5 mm, densely white-hairy, deciduous.

Corolla: scarcely longer than calyx, tube hairy, limb minute, rotate, lobes imbricate in bud.

Stigma: elongate-conical, hairy at apex, as long as style.

Nutlets: large, 1-seeded by abortion, flattened on one side, glabrous.

Fl.: 7-10. Field margins, s.l.-1200 m.

Iranica 1994

34. *Heliotropium supinum* L., Sp. pl.: 130. 1753 = *Piptoclaina supina* (L.) G.Don, Gen. hist. 4: 364. 1837. Lectotype (Verdcourt 1987): in Monspelii in littore maris, Burser Herbarium vol. 14(2): 2 (UPS). Fig.: plate 14 e, page 161.

Plant: Annual, prostrate, stems up to 50 cm long, much branched from base and stem, **indument** appressed tomentose, mixed with long patent hairs of 1-1.3 mm length.

Leaves: 1.5-2 (3) cm long, 1-2 cm broad, ovate to elliptic-orbicular, acute or obtuse, cuneate at the base, entire or slightly undulate at margin, **petiole** up to 1 cm; **nerves** impressed on upper side, prominent on lower one.

Cymes: lateral and terminal, relatively short, up to 6 cm long, with up to 20 **flowers**, uniseriate, unilateral.

Calyx: dropping together with nutlet;

calyx lobes: in **flowering** time ca. 2 mm, in **fruiting** time 3-5 mm long, obtuse, connate to 3/4 of length.

Corolla: ca. 2-3 mm long, tubular, expanded at the base, **inside** glabrous, **outside** appressed downwards pilose;

corolla lobes: minute, ca. 0.2-0.3 mm broad, ovate-oblong, obtuse, **intercalary lobes** missing or if present extremely minute.

Anthers: ca. 0.8 mm long, acute, inserted 1 mm above corolla base.

Stigma: ca. 0.5 mm long, apex pilose.

Style: ca. 0.2-0.3 mm long, pilose.

Fruit: only of a single one-seeded **nutlet** of 4-5 mm in diameter, glabrous, thickened at edges.

General distribution: Southern Europe, Africa, Arabia, Syria, Iraq, Iran, Russia, Central Asia, Pakistan, India.

Note: *H. supinum* is readily distinguished by its prostrate habit, the fruit consisting of a single one-seeded nutlet and the caducous, gamosepaluous, fruit-enclosing calyx. The species is usually collected in river beds (sometimes with *Tamarix* shrubs), on alluvial-clay and sandy soils.

Flora Iranica 1966

74. *H. supinum* L. Spec. Plant. 130 (1753). Type: "Habitat Salmanticae juxta agros Monspelii in litore".

Plant: Annual, many-stemmed, with prostrate, dwarf stems, very densely spreading-hairy with rather long hairs, subsimple or sparingly branched in the upper part.

Leaves: long-petiolate, up to 18(-20) mm long, 10(-12) mm wide, ovate or obovate or ovate-lanceolate, acuminate or more rarely obtuse, with **nerves** impressed above, prominent beneath, strigulose with appressed hairs on the **upper** surface, very densely greyish-tomentose on the **lower** surface, with entire, slightly revolute margin.

Inflorescences: dense, very short, mostly 2-5 crowded together.

Calyces: sessile, 2-2.5 mm long, with linear **lobes** densely spreading whitish-hairy, rather obtuse or subacute, falling with the nutlet.

Corolla: only slightly longer than the calyx, 2.5 mm long, with cylindrical **tube** hairy **outside**, glabrous **inside**, **limb** minute with 5 ovate lobes, eventually spreading, flattened, rounded, imbricate in aestivation.

Anthers: linear, situated below the middle of the corolla.

Stigma: elongate-conical, hairy at apex, about as long as the glabrous **style**.

Fruit: Only one large **nutlet** fully developed, plano-convex, glabrous, **very rarely** 4 free nutlets.

74. *H. supinum* L. Spec. Plant. 130 (1753). Typus: "Habitat Salmanticae juxta agros Monspelii in litore". Annuum, multicaule, caulibus prostratis, pumilis, densissime longiuscule patule pilosis, subsimplicibus vel in parte superiore parce ramosis. Folia longe petiolata, usque ad 18(-20) mm longa, 10(-12) mm lata, ovata vel obovata vel ovato-lanceolata, acuminata vel rarius obtusa, nervis supra impressis, subtus prominentibus, in facie superiore pilis appressis strigulosa, in facie inferiore densissime canescenti-tomentosa, margine integro, subrevoluto. Inflorescentiae densae, brevissimae, plerumque 2-5 confertae. Calyces sessiles, 2-2.5 mm longi, laciniis linearibus dense patule albido-pilosis, obtusiusculis vel subacutis, cum nuce decidui. Corolla calyce paulo tantum longior, 2.5 mm longa, tubo cylindrico extra piloso, intus glabro, limbo minuto lobis 5, ovatis, demum patentibus, explanatis, rotundatis, aestivatione imbricatis. Antherae lineares, infra mediam corollam sitae. Stigma elongato-conicum apice hirsutum, stylo glabro subaequilongum. Nucula unica magna tantum evoluta, plano-convexa, glabra, rarissime nuculae 4 liberae. Iraq: Kurd.: Mosul: 1 km NE pontem prope Mindan, 300 m, Chapman 26191. Niniveh, Bornm. 1581. - Diyala Jabal: Hamrin, Herb. BM. Talish: Kimbashi, Hohen.

Flora Iberica 2012

H. supinum L., Sp. Pl.: 130 (1753) [*supinum*] Type locality: "Habitat Salmanticae juxta agros, Monspelii in littore" [lectotype designated by B. Verdcourt in Kew Bull. 42: 710 (1988); UPS ex herb. Burser XIV(2): 2] Iconography: Rchb. fil. in Rchb., Icon. Fl. Germ. Helv. 18, tab 93 (1858); Valdés, Talavera & Galiano (eds.), Fl. Andalucía Occid. 2: 376 (1987)

Plant: Herb up to 80(100) cm, annual, ± villous, ± greenish, sometimes cinereous.

Stems: generally decumbent, with long, patent hairs up to 1.5(2) mm and short, appressed hairs.

Leaves: alternate, petiolate; petiole 0.5-2(2.5) cm; blade (0.7)1-3(4.5) × 0.5-3 cm, elliptic or ovate, sometimes suborbicular, villous, more markedly on the abaxial surface, with patent hairs up to 1.5 mm, and shorter, appressed hairs.

Inflorescence: with paired, dense cymes, 2-6(8) cm in flower, up to 16 cm in fruit.

Flowers: ebracteate, sessile.

Calyx: divided c. 1/3 of its length, caducous with the fruit, in flower 1.5-2.5(3.5) mm, in fruit up to 4.5(6) mm, ovoid, ± villous, with straight hairs; lobes triangular, acute, on the outer surface with patent hairs up to 0.7 mm and appressed hairs up to 0.3(0.4) mm, and on the inner surface only with short, appressed hairs.

Corolla: infundibuliform or hypocrateriform, 0.9-1.5(2) mm in diameter, ± hairy externally, at least on the upper half of the tube;

tube: (0.8)1-2.5(3) mm, as long as the calyx or somewhat longer;

lobes: 0.5-0.7 × 0.3-0.5 mm, from suborbicular to narrowly triangular, with a longitudinal fold between the lobes, glabrescent.

Stamens: inserted towards the middle of the corolla tube;

anthers: 0.8-0.9(1.1) mm, almost conical, brown.

Ovary: with style 0.4-0.5 mm, pubescent;

stigma: discoid, prolonged into a sterile appendage 0.4-0.45 mm, conical and pubescent.

Fruit: entire, with 1 nutlet, rarely with 2 or 3.

Nutlets: 3-4 × 2-3(3.5) mm, ovoid, transverse section almost elliptic, with the dorsal surface narrowly winged, smooth or irregularly tuberculate, glabrous, from dark brown to greenish-yellow.

2n: = 16; n = 8.

Hab/Flw: Grasslands ± humid, sometimes ruderal, on sandy or clayey substrate, ± saline and ± nitrified; 0-680 m. VI-XI.

Geo/Names: S Europe, Africa, Canary Islands -Fuerteventura- and W Asia. Present in much of the Iberian Peninsula, absent from almost all the northern third. Spain: A Av Ba Ca Cc Co (Cs) Gr Gu H (Hu) J M Ma Sa Sg Se Te To (V) Va Za. Portugal: AAl Ag BAl BB BL E R TM. Vernacular names: alacranera, heliotropio común, hierba del alacrán, tornasol, verruguera; Catalan: cua d'alacrà, cua d'escorpí, herba berruguera, matapassarell, passarellera. Remarks.-The record for Alicante is based on a specimen collected by A.J. de Cavanilles (MA 94815). Since then, apparently, it has not been collected again in this province.

H. supinum L., Sp. Pl.: 130 (1753) [supinum] Ind. loc.: "Habitat Salmanticae juxta agros, Monspelii in littore" [lectótipo designado por B. Verdcourt in Kew Bull. 42: 710 (1988): UPS ex herb. Burser XIV(2): 2] Ic.: Rchb. fil. in Rchb., Icon. Fl. Germ. Helv. 18, tab 93 (1858); Valdés, Talavera & Galiano (eds.), Fl. Andalucía Occid. 2: 376 (1987) - Hierba hasta de 80(100) cm, anual, ± vilosa, ± verdosa, a veces cenicienta. Tallos generalmente decumbentes, con pelos largos y patentes hasta de 1,5(2) mm y pelos cortos y adpresos. Hojas alternas, pecioladas; peciolo 0,5-2(2,5) cm; limbo (0,7)1-3(4,5) × 0,5-3 cm, elíptico u ovado, a veces suborbicular, viloso, más marcado por el envés, con pelos patentes hasta de 1,5 mm, y pelos más cortos y adpresos. Inflorescencia con cimas geminadas, densas, de 2-6(8) cm en la floración, hasta de 16 cm en la fructificación. Flores ebracteadas, sésiles. Cáliz dividido c. 1/3 de su longitud, caedizo con el fruto, en flor de 1,5-2,5(3,5) mm, en fruto hasta de 4,5(6) mm, ovoide, ± viloso, con pelos rectos; lóbulos triangulares, agudos, en la cara externa con pelos patentes hasta de 0,7 mm y adpresos hasta de 0,3(0,4) mm, y en la interna solo con pelos cortos y adpresos. Corola infundibuliforme o hipocrateriforme, de 0,9-1,5(2) mm de diámetro, ± pelosa externamente, al menos en la mitad superior del tubo; tubo (0,8)1-2,5(3) mm, de la longitud del cáliz o algo más largo; lóbulos 0,5-0,7 × 0,3-0,5 mm, de suborbiculares a estrechamente triangulares, con un pliegue longitudinal entre los lóbulos, glabrescentes. Estambres insertos hacia la mitad del tubo de la corola; anteras 0,8-0,9(1,1) mm, casi cónicas, pardas. Ovario con estilo de 0,4-0,5 mm, pubescente; stigma discoide, prolongado en un apéndice estéril de 0,4-0,45 mm, cónico y pubescente. Fruto entero, con 1 núcula, rara vez con 2 ó 3. Núculas 3-4 × 2-3(3,5) mm, ovoide, de sección transversal casi elíptica, con el dorso estrechamente alado, liso o irregularmente tuberculado, glabro, de un pardo obscuro a verde-amarillentas. 2n = 16; n = 8. Pastizales ± húmedos, a veces arvense, en substrato arenoso o arcilloso, ± salino y ± nitrificado; 0-680 m. VI-XI. S de Europa, África, Canarias -Fuerteventura- y W de Asia. Presente en buena parte de la Península Ibérica, ausente en casi todo el tercio norte. Esp.: A Av Ba Ca Cc Co (Cs) Gr Gu H (Hu) J M Ma Sa Sg Se Te To (V) Va Za. Port.: AAl Ag BAl BB BL E R TM. N.v.: alacranera, heliotropio común, hierba del alacrán, tornasol, verruguera; cat.: cua d'alacrà, cua d'escorpí, herba berruguera, matapassarell, passarellera. Observaciones.-La cita para Alicante se basa en un pliego recolectado por A.J. de Cavanilles (MA 94815). Desde entonces, al parecer, no ha vuelto a recolectarse en esta provincia.

Flora Europaea 1972

12. *H. supinum* L., Sp. Pl. 130 (1753).

Plant: Annual, branched at the base, the central branch erect, the lateral procumbent.

Leaves: up to 3.5 × 2 cm, narrowly elliptical to suborbicular, rounded or cuneate at the base, whitish-pubescent at least beneath, the veins conspicuously impressed above; petiole 0.3-1.5(2) cm.

Calyx: 2-2.5 mm, lobed to less than 1/4 of its length, tubular, accrescent in fruit and becoming pyriform, closely enfolding the fruit and falling with it.

Corolla: 2.5-3 mm, the limb white.

Style: almost as long as stigma, inserted slightly obliquely on the ovary;

stigma: conical, hairy, often shallowly bifid.

Fruit: a single one-seeded nutlet.

Geo: S. Europe, extending northwards to Hungary. Al BI Bu Co Cr Ga Gr Hs Hu It Ju Lu Rm Sa Si.

Capensis 1904

3. *H. supinum* (Linn. Sp. Pl. ed. i. 130);

Plant: hirsute; stem herbaceous, decumbent at the base;

leaves: opposite or alternate, oval, obtuse, more or less crenate, up to 9 by 6 lin., shortly petioled;

cymes: simple or once forked, up to 5 in. long;

calyx: 1.5 lin. long, hairy outside;

lobes: 1/5 as long as the tube, obtuse;

corolla-tube: as long as the calyx; lobes exerted, very short, rounded;

stamens: inserted just below the middle of the corolla-tube;

ovary: glabrous;

style: as long as the ovary;

mature nutlets: 1-2 to each flower, 2 lin. long, plano-convex, dark brown, with a lighter brown border, enclosed in the persistent calyx, obscurely tubercled.

ovalifolium

PoWo as *Euploca ovalifolia* (Forssk.) Diane & Hilger: **Native:** most of Africa incl. Egypt, Turkey, parts of Arabian peninsula, Pakistan, India & eastwards - Angola, Assam, Bangladesh, Botswana, Burkina, Burundi, Cameroon, Cape Provinces, Caprivi Strip, Chad, Djibouti, DR Congo, Egypt, Eritrea, Eswatini, Ethiopia, Gabon, Ghana, Guinea-Bissau, India, Kenya, KwaZulu-Natal, Lesser Sunda Is., Madagascar, Malawi, Mali, Mauritania, Mozambique, Myanmar, Namibia, Nepal, Niger, Nigeria, Northern Provinces, Oman, Pakistan, Palestine, Senegal, Socotra, Solomon Is., Somalia, Sudan-South Sudan, Tanzania, Thailand, Türkiye, Uganda, Vietnam, Yemen, Zambia, Zimbabwe. **Intro:** Chagos Archipelago, Ogasawara-shoto

PDF 2000 Duman & Altinözlü

Heliotropium ovalifolium Forssk., Fl. Aegypt.-Arab. 38 (1775). Figure 1.

Plant: Annual, up to 5-15 cm tall, much branched, densely clothed with soft whitish adpressed hairs.

Leaves: petiolate, **petiole** 1-5 mm long.

Lamina: 7-15 x 2-4 mm, elliptic to obovate or oblong, acute to mucronate, **adpressed** hairy on both surfaces (some hairs with **tubercles**).

Inflorescence: a terminal cyme, slender, 2-4 cm long, **sometimes forked**, ebracteate, **flowers**

sessile or subsessile.

Calyx: c. 1.5-2 mm long, divided to base, 5-partite into unequal lobes, one lobe ovate-lanceolate, much broader than the four other linear lobes, white setose hairy outside, persistent.

Corolla: white, c. 3 mm long, lobes 1/3 as long as tube;

Tube: cylindrical, outside hairy;

Lobes: ovate, apiculate.

Stamens: inserted just above base of corolla;

Anthers: small, lanceolate, 0.5-0.6 mm long.

Ovary: glabrous.

Style: inconspicuous.

Stigma: c. 0.4 mm long, conical, apex minutely setose.

Fruit: ovoid;

Nutlets: 4, c. 1.5 mm long, adpressed hairy.

Fl. and Fr.: 8-9. Moist sandy place, nr. s.l.

Examined specimen: C5 Adana: Karataş, Yumurtalık Lagünü Tabiatı Koruma Alanı, Torluk, moist sandy place, nr s.l., 9 ix 1997, H. PaŰban 1938 with H. Duman (GAZI, HUB).

Distribution: Africa, Arabia, Canary Islands, Pakistan, India, Indo-China, Australia.

Recognition: *Heliotropium ovalifolium* is similar to *H. lasiocarpum* Fisch. & Mey. according to the Flora of Turkey and East Aegean Islands (1). It differs in its smaller stems (5-15 cm, not 50 cm or more), smaller leaves (7-15 x 2-4 mm, not 15-40 x 10-40 mm); shorter calyx (c. 1.5-2 mm long versus 2.5-3 mm); lanceolate and shorter anthers (0.5-0.6 mm long, not c. 1 mm); conical stigma with minutely setose apex (not glabrous and squat-conical); inconspicuous style.

Conservation: Recommended IUCN Threat Category (4) is Critically Endangered (CR) within Turkey, because the estimated area of occupancy is less than 10 km², and the population is very pure. We collected only 20 specimens in one location. For this reason, we consider that the species in Turkey is in extreme danger.

Capensis 1904

Corolla-tube short:

Leaves linear, glabrous -- *currassavicum*

Leaves oval, hairy

Lateral nerves not impressed above -- *ovalifolium*

Lateral nerves conspicuously impressed above -- *supinum*

H. ovalifolium (Forsk. Fl. Agypt.-Arab. 38);

stem: woody, branched from near the base, densely covered with adpressed hairs, up to 1 ft. high and 3 lin. in diam.;

leaves: oval, slightly tapering downwards, apiculate, 1 in. by 5 lin., densely clothed on both surfaces with adpressed hairs;

petiole: 5 lin. or less long; cymes usually once forked, elongating to 9 in. in fruit;

calyx: 1 lin. long, adpressedly hairy outside; lobes 5, unequal, reaching nearly to the base of the calyx, lanceolate, acute;

corolla: twice as long as the calyx ;

lobes: 1/2 by 1/3 lin., ovate, acute;

stamens: inserted below the middle of the corolla-tube;

filaments: short, very slender;

anthers: oblong; **connective** produced into a beak as long as the anther-cell;

ovary: glabrous;

style: thick, pyramidal, as long as the **ovary**;

nutlets: 4, each nestling in a calyx-lobe, flat on the two inner faces, convex on the back.

syn: Hook.f. Fl. Brit. Ind. iv.150. *H. coromandelianum*, Retz. Obs. ii. 9; Lehm. Pl. Asper. 46; *H. obovatum*, DC. Prod, ix. 541. *H. apiculatum*, E. Meyer in Drige, Zwei Pflanzengeogr. Documente, 93.

Egypt 1912

Annuals

Calyx persistent.

Stigma tapering from a conical base

Leaves tapering to the base.

Leaves obovate 4. *H. ovalifolium*.

Leaves oblong 5. *H. europaeum*.

1093. (4.) *Heliotropium ovalifolium* Forsk. Flor. aeg.-arab. (1775), p. 38. - *Heliotropium Brocchianum* Vis. Plant. Aegypt. and Nub., p. 8 tab.2 fig.1. - *Heliotropium Kunzei* Lehm. Icon. and Descript. Stirp., p. 19 tab. 29. - Boiss. Flor. Or. IV, p.130. - Aschers.-Schweinf. Ill. Flor. d'Eg., p. 109 no. 716. - Sickenberg. Contrib. Flor. d'Eg., p. 260. - *Heliotropium cinereum* R. Br. in Salt, Abyss. Plant. App., p.63. - *Heliotropium niloticum* DC. in DC. Prodrum, IX, p. 541.

Plant: Herbaceous from a woody base.

Stem: much-branched, diffuse, densely clothed with soft whitish spreading **hairs**.

Leaves: obovate or elliptic, obtuse, densely **hairy** on both surfaces, 1-3 1/4 cm long, 6-12 mm broad; **petiole** 5-18 mm long.

Cymes: spicate, numerous, rather, dense, ebracteate, finally 3-6 cm long.

Calyx: 1 mm long, white hairy outside; on **lobe** lanceolate, much broader than the linear others.

Corolla: 2 mm long; **lobes** 1/5 as long as the tube, orbicular.

Stamens: inserted just above the corolla-base;

anthers: small, lanceolate.

Ovary: globose; **stigma** subsessile, conical.

Fruit: depressed globose, scarcely 2.5 mm in diam.;

nutlets: 4, hispid.

Flow.: February to March.

Keys to Flora of Egypt 2015

* **Leaf** margin entire; **flower** pedicelled; **style** terminal

* **Leaf** apex acute; simple **hairs** on leaves present; bulbs hairs on leaves absent

* **Plant** woody shrub; **stem** branching from base; leaf **veins** not prominent; woolly **hairs** on leaves absent -- *Heliotropium ovalifolium* Forssk.

Malesiana 1997

8. *Heliotropium ovalifolium* Forssk., Fl. Aegypt.-Arab. (1775) 38. - Type: Forsskal s.n. (C holo), Yemen, Hadie.

Plant: Perennial herb, sometimes with woody base.

Stems: up to 40 cm high, much branched, covered by antrorsely appressed, short hairs.

Leaves: petiole 1-5 mm long; blade oblong-obovate, 10-15 by 3-4 mm, tapering gradually towards base, apex obtuse, rarely subacute, nerves indistinct, hairs on both sides white, silky, antrorse, sometimes a little patent.

Inflorescence: a spike-like, ebracteate cyme, flowers more or less dense, arranged in two ranks; pedicels usually less than 0.5 mm.

Calyx: 2 mm long, cleft to the base, covered densely by antrorse hairs, lobes 0.5-0.6 mm wide, slightly unequal.

Corolla: funnel-shaped, white, 3 mm long, 2 mm in diam., with dense, antrorse hairs outside, lobes ovate-triangular to ovate, 0.8 mm long.

Stamens: anthers subsessile at middle of tube.

Pistil: stigma sessile or subsessile, conical from a wider base.

Nutlets: 4, ovoid, densely antrorse hairy.

Distribution: Tropical Africa, Arabian Peninsula, India, Vietnam, Solomon Islands; Malesia: Lesser Sunda Islands (Sumba, Timor).

Habitat: In valleys, on road sides, in dried pond, etc.

dineshkhedkar.co.in

<https://www.dineshkhedkar.co.in/mpdb/record.php?act=view&id=MH152>

MH152 : *Heliotropium ovalifolium* Forssk. = *Euploca ovalifolia* (Forssk.) Diane & Hilger

Plant: Grey, hispid, **erect or decumbent**, perennial or annual herbs with a **frutescent** base, 1-4 cm high; **stem** and **branches** densely clothed with long silky adpressed and also spreading **hairs**.

Leaves: alternate, 1.5-2.5 cm x 5-13 mm, obovate or elliptic, obtuse and usually mucronate at the apex, rounded at the **base**, closely pubescent with adpressed, long silky **hair** on both surfaces, **margins** narrowly revolute, **midrib** impressed above and raised below;

petioles: channelled, up to 1.2 cm long, **upper** shorter.

Flowers: white, **two ranked in binate or trinate**, on slender, ebracteate 4-5 cm long spikes.

Calyx: 1-2.5 mm long, persistent, enlarging in fruits, **hairy** on both sides with short, adpressed hairs, divided almost to base; **segments** very unequal, one of them almost twice as broad as others, ovate, acute, densely ciliate; other segments small, linear-oblong, subacute, ciliate.

Corolla: 3 mm long; tube cylindric, scarcely swollen over the stamens, hairy outside, with a few club-shaped hairs on throat inside;

lobes: 1 mm long, ovate, oblong, acute, without **intermediate** teeth.

Stamens: inserted below the middle of corolla-tube;

anthers: lanceolate, acute, the **connectives** produced.

Ovary: pubescent; the **style** almost 0; **stigma** conical.

Fruit [!nutlets]: more than 1 mm long, densely setulose with silky white hairs on the convex back, one-seeded, with circular inconspicuous depression on the inner facies.

Fl. Per.: July-August.

Hab: In drying ponds and shallow depressions and on mud flats in river beds

Flora of West Tropical Africa 2014

KEY

1. **Leaves** linear to obovate (never ovate) (v broadly ovate)

2. **Corolla**-lobes without filiform points

3. **Leaves** rather broadly obovate-oblongate to obovate (v more or less lanceolate to linear)

4. **Flowers** very small and numerous in a close slender spike-like cyme, **appressed-pilose**; **calyx** 2-3 mm. long; **leaves** oblong-elliptic, densely to thinly villous on both sides; **fruits** depressed, pubescent -- 3. ovalifolium

Heliotropium ovalifolium Forsk. Fl. Aegypt.-Arab., Descr. Pl. 38 (1775); F.T.A. 4, 2: 34; Berhaut Fl. Sén. 201. APD: Synonym of *Euploca ovalifolia* (Forssk.) Diane & Hilger *Heliotropium niveum* A. Chev. Bot. 450, name only.

Diffuse densely **white-villous** stems from a **woody base** and taproot, with small white **flowers** in **cymes** 2-3 in. long.

Flora of Pakistan

12. *Heliotropium ovalifolium* Forssk., Fl. Aegypt.-Arab. 38. 1775. Clarke in Hook. f., Fl. Brit. Ind. 4:150.1883; Wight, Icon. Pl. t. 1388.1848; I. M. Johnston in J. Am. AM. 32.111.1951; Kazmi, l.c. 178; Cooke, Fl. Bomb. Pres. Reprint ed. 2,2:278. 1967 Bhandari, Fl. Ind. Desert, 235.1978.

Plant: Annual up to 40 cm tall, branched.

Leaves: petiolate, greyish-white with dense **hairs**; **petiole** 5-10 mm long. **Lamina** 10-25 x 4-13 mm, elliptic to obovate, mucronate, appressed **hairy** on both surfaces.

Inflorescence: terminal, slender, 2-13 cm long, **sometimes forked**, ebracteate, bearing **biseriate** flowers.

Calyx: c. 2 mm long, 5-partite into unequal lobes, setose, persistent.

Corolla: white, c. 3 mm long, **tube** cylindrical, **hairy** to the outside, sparsely so in the throat; **lobes** ovate, apiculate.

Anthers: 0.5-0.6 mm long, narrow, attached c. 0.5 mm from corolla base, **connective** produced.

Stigma: c. 0.4 mm long, conical, apex minutely **setose**. **Style** inconspicuous. **Ovary** glabrous.

Fruit: ovoid; **nutlets** 4, c. 1.5 mm long, **appressed hairy**.

Fl. Per.: July-August.

Flora of Tropical East Africa

Cymes: 1-3, terminal, scorpioid, spike-like, **often paired**, at first often very short and ± capitate, 1.5-15 cm. long, **strigose**; **flowers** disposed in **2 ranks**, at first subsessile; **peduncles** up to 3.5 cm. long; **pedicels** accrescent, 0.5-2 mm. long finally decurrent.

Calyx: 1.6-3.5 mm. long, **strigose** outside, persistent and accrescent in fruit, deeply divided into **unequal lanceolate lobes**, 1.5-3.3 mm. long, 0.3-1.2 mm. wide.

Plant: Usually a **perennial** herb 7-90 cm. long or tall with thick woody taproot and stems branched, procumbent, woody at the base but sometimes erect and apparently sometimes annual (?flowering in first year);

stems: often compressed, very leafy, silky-silvery pubescent on the young branches.

Leaf-blades: obovate or elliptic, 0.5-5.5 cm. long, 0.25-2.5 cm. wide, retuse but mucronate or apiculate or less often acute at the apex, **cuneate** at the base, **pubescent to strigose-villous**, often silvery on both surfaces, the **hairs** of two sorts, longer and tubercle-based and shorter and thinner, the **margins** entire, narrowly thickened, only the costa distinctly visible;

petiole: up to 1.5(-2) cm. long.

Stigma: sessile, conic with basal crown, 0.5-0.7 mm. long, truncate or sometimes very **shortly bifid** with several erect hairs at apex.

Fruits: subglobose, flattened, 1.7-2 mm. diameter, 4-lobed and breaking into 4 **nutlets**, the external face densely covered with short ± adpressed white hairs; internal faces devoid of cavities.

Corolla: white, often yellow at the throat, strigose-pubescent outside with adpressed hairs; **tube** cylindrical, enlarged at the middle, (1.4-)2.3-3.7 mm. long, with a **ring of adpressed hairs** inside at tops of anthers; **lobes** broadly elliptic to ovate-triangular, erect or spreading, 0.7-1 mm. long, 0.4-1.5 mm. wide, the acute apices sometimes inflexed.

Ovary: subglobose, 0.5 mm. diameter, glabrous or pubescent at the **tip**. Fig. 19/6, p. 71.

Flora Zambesiaca

Plant: Erect or decumbent annual or perennial herb up to 60(90) cm. high with a thin rootstock; stems pubescent, woody or subwoody to the base, branches often laterally compressed and silvery-sericeous to the extremities.

Flowers: subsessile but **pedicels** increasing up to 2 mm. in fruit and decurrent on the rachis.

Cymes: dense, up to 17 cm. long when completely developed, often 2, sometimes 1 or 3, rarely 4 together; common **peduncle** 2-4(6) cm. long.

Fruits: c. 1.5 x 2.0 mm., subglobular depressed, densely clothed with whitish appressed short hairs; **nutlets** 4, free, with the inner surfaces without cavities.

Corolla: pubescent outside, glabrous inside save by a **ring** of flattened hairs (sometimes lacking) at the level of the **anther** tips, usually with yellow tube and white **limb**; **tube** 1.5-3.0 mm. long, slightly widened at the middle; **lobes** 0.5-1.5(2.0) x 0.4-1.5 mm., unequal or subequal, broadly ovate to triangular-ovate, suberect, apex acute or apiculate.

Calyx: **lobes** unequal, the largest one up to 3.0 x 1.0 mm. (6.0 x 1.5 mm. in fruit), ovate, the smallest one 1.0-2.0 x 0.2-0.4 mm., lanceolate, strigose outside and inside.

Style: very short; **stigmatic ring** well-marked; **sterile appendix** 0.3-0.6 mm. long, conical with apex truncate or minutely 2-dentate, glabrous or shortly hairy.

Stamens: inserted on the lower third of the corolla tube;

anthers: 0.7-1.2 mm. long, narrowly lanceolate, minutely hairy at apex, subsessile.

Leaves: numerous, alternate; **petiole** 2-20 mm. long, pubescent to villous; **lamina** 10-60 x 4-30 mm., obovate or elliptic, pubescent, strigose-villous or tomentose on both surfaces, with hairs of two kinds, long and hardy, appressed and with swollen bases, some weak, short and spreading, at least on the basal leaves, the **others**, rounded to retuse, rarely subacute but always apiculate or mucronate at apex, acute or subacute at base, **margins** slightly revolute.

Flore d'Afrique Centrale

GOOGLE

Plant: Herb 7-60(90) cm high, usually perennial, with a woody taproot; stems branched, procumbent, woody at the base, pubescent, silky-silvery in young shoots which are often compressed.

Leaves: numerous, with **petioles** 2-15(30) mm long, strigose-pubescent; blade obovate or elliptic, (5)10-50 mm long and 2.5-25 mm wide, cuneate at the base, retus-mucronate, apiculate or rarely acute at the apex, pubescent to strigose-villous, sometimes silvery on both surfaces, with two kinds of hairs, the longest and thickest tuberculate at the base, the others thinner and shorter, with entire **margins**, tightly rolled; **midrib** alone distinct.

Cymes: Scorpioid, spike-like cymes, most often in pairs, sometimes simple or in 3s, terminal, with a flowering end rolled into a crozier, lacking bracts, 1.5-9(15) cm long, strigose.

Flowers: 'Flowers' small, white, sometimes yellow at the throat, arranged in 2 rows, 2.6-4.7 mm long and 2-3 mm in diameter, subsessile; **pedicel** accrescent, 0.5-1(2) mm below the fruit, decurrent on the rachis;

Calyx: 1.6-3.3 mm long, hairy-strigous externally, persistent and accrescent below the fruit, deeply cut into unequal lanceolate **lobes**, the shortest 1.6-2.8 mm long and 0.3-0.5 mm wide, the largest

2-3.3 mm long and 0.9-1.2 mm wide;

Corolla: 3-4.5 mm long, pubescent-strigous externally, with appressed hairs; cylindrical **tube**, enlarged in the middle, (1.4)2.3-3.7 mm long, furnished internally at the apex of the **anthers** with a **ring of appressed hairs**; **lobes** broadly ovate to ovate-triangular, spreading-erect, 0.7-1 mm long and 0.4-1.5 mm wide, shortly acute at the apex, finely **veined**, with the tip often folded inwards;

Stamens: inserted about 0.5-1 mm from the base of the tube; **filaments** short or subnulose;

Anthers: lanceolate, 0.7-0.8 mm long, subacute and surmounted by a few minute hairs, contiguous at the apex; **ovary** subglobose, 0.5 mm in diameter, glabrous, rarely pubescent at the apex;

Stigma: sessile, conical, with a basal crown, about 0.5-0.7 mm long, truncate or sometimes very shortly bidentate and furnished with a few erect hairs at the **apex**; **disc** absent.

Fruits: subglobose, depressed, about 2 mm in diameter, 4-lobed and breaking into 4 **nutlets** with an outer face densely covered with short, \pm appressed, white hairs and inner faces without cavities.

Herbe' de 7-60(90) cm de haut, g n ralement p renne,   souche ligneuse pivotante; tiges ramifi es, procombantes, ligneuses   la base, pubescentes, soyeuses-argent es chez les jeunes rameaux qui sont souvent comprim s. ' Feuilles' nombreuses,   p tiol  de 2-15(30) mm, strigieux-pubescent; limbe obovale ou elliptique, de (5)10-50 mm de long et 2,5-25 mm de large, cun     la base, r tus-mucron , apicul  ou rarement aigu au sommet, pubescent   strigieux-villeux, parfois argent  sur les 2 faces,   poils de 2 sortes, les plus longs et les plus  pais tubercul s   la base, les autres plus minces et plus courts,   bord entier,  troitement enroul ; nervure m diane seule distincte. Cymes scorpio ides, spiciformes, le plus souvent par paires, parfois simples ou par 3, terminales,   extr mit  florif re enroul e en crosse, d pourvues de bract es, de 1,5-9(15) cm de long, strigieuses. ' Fleurs' petites, blanches, parfois jaunes   la gorge, dispos es en 2 rangs, de 2,6-4,7 mm de long et 2-3 mm de diam., subsessiles; p dicelle accrescent, de 0,5-1(2) mm sous le fruit, d current sur le rachis; calice de 1,6-3,3 mm de long, velu-strigieux ext rieurement, persistant et accrescent sous le fruit, profond ment d coup  en lobes lanc ol s, in gaux, les plus courts de 1,6-2,8 mm de long et 0,3-0,5 mm de large, le plus grand de 2-3,3 mm de long et 0,9-1,2 mm de large; corolle de 3-4,5 mm de long, pubescente-strigieuse ext rieurement,   poils apprim s; tube cylindrique,  largi au milieu, de (1,4)2,3-3,7 mm de long, garni int rieurement au niveau du sommet des anth res d'un anneau de poils apprim s; lobes largement ovales   ovales-triangulaires,  tal s-dress s, de 0,7-1 mm de long et 0,4-1,5 mm de large, courtement aigus au sommet, finement nervill s,   extr mit  souvent repli e vers l'int rieur;  tamines ins r es   environ 0,5-1 mm de la base du tube; filets courts ou subnuls; anth res lanc ol es, de 0,7-0,8 mm de long, subaigu s et surmont es de quelques poils minuscules, coh rentes par le sommet; ovaire subglobuleux, de 0,5 mm de diam., glabre, rarement pubescent au sommet; stigmat  sessile, conique,   couronne basale, d'environ 0,5-0,7 mm de long, tronqu  ou parfois tr s courtement bident  et garni de quelques poils dress s au sommet; disque absent. ' Fruits subglobuleux, d prim s, d'environ 2 mm de diam., 4-lob s et se brisant en 4 nucules   face externe dens ment couverte de poils courts, \pm apprim s, blancs et   faces internes d pourvues de cavit s.

e-Flora of South Africa

Plant: Perennial herb, up to 600 mm tall.

Leaves: obovate, covered with stiff **hairs**, somewhat silvery.

Flowers: in a helicoid cyme, white, calyx much shorter than corolla tube. **Rain-dependent**. Erect or decumbent annual or perennial herb up to 60(90) cm high with a thin rootstock; **stems** pubescent, woody or subwoody to the base, **branches** often laterally compressed and silvery-sericeous to the extremities.

Leaves: numerous, alternate; **petiole** 2-20 mm long, pubescent to villous; **lamina** 10-60 x 4-30 mm, obovate or elliptic, pubescent, strigose-villous or tomentose on both surfaces, with **hairs** of two kinds, long and hardy, appressed and with swollen bases, some weak, short and spreading, at least on the basal leaves, the others, rounded to retuse, rarely subacute but always apiculate or mucronate at apex, acute or subacute at base, **margins** slightly revolute.

Cymes: dense, up to 17 cm long when completely developed, often 2, sometimes 1 or 3, rarely 4 together; common **peduncle** 2-4(6) cm long.

Flowers: subsessile but **pedicels** increasing up to 2 mm in fruit and **decurent** on the rhachis.

Calyx: lobes **unequal**, the largest one up to 3.0 x 1.0 mm (6.0 x 1.5 mm in fruit), ovate, the smallest one 1.0-2.0 x 0.2-0.4 mm, lanceolate, strigose outside and inside.

Corolla: pubescent outside, glabrous inside save by a **ring** of flattened hairs (sometimes lacking) at the level of the anther tips, usually with yellow tube and white **limb**; **tube** 1.5-3.0 mm long, slightly widened at the middle; **lobes** 0.5-1.5(2.0) x 0.4-1.5 mm, unequal or subequal, broadly ovate to triangular-ovate, suberect, apex acute or apiculate.

Stamens: inserted on the lower third of the corolla tube;

anthers: 0.7-1.2 mm long, narrowly lanceolate, minutely hairy at **apex**, subsessile.

Style: very short; stigmatic **ring** well-marked; **sterile appendix** 0.3-0.6 mm long, conical with apex truncate or minutely 2-dentate, glabrous or shortly hairy.

Fruits: c. 1.5 x 2.0 mm, subglobular depressed, densely clothed with whitish appressed short hairs;
nutlets: 4, free, with the inner surfaces without cavities.

[Unsure why it is presented twice]

Plant: Erect or decumbent annual or perennial herb, up to 0.6(-0.9) m high.

Leaves: obovate or, rarely, elliptic, apiculate, densely covered with long silvery appressed hairs.

Corolla: lobes broadly ovate to triangular-ovate, acute or apiculate.

Style: very short.

Cymes: not bracteate.

Fruit: clothed with short hairs.

Flowers: with white **limb** and yellow **tube**. **Annual** or occasionally perennial herb, up to 0.6 m high.

Leaves: shortly to long-petiolate; **blade** elliptic to obovate, somewhat silvery; **petioles** up to 8 mm long.

Flowers: in helicoid cymes.

Calyx: much shorter than corolla.

Corolla: white with yellow throat.

Fruit: of 4 densely pubescent **nutlets**.

Habitat: Forêts claires, savanes, prairies marécageuses, dunes, bords de lacs et de rivières, cultures, jachères, terrains vagues, endroits frais. [Flore d'Afrique Centrale] Grasslands, floodplains, edges of swamps, riverbanks, roadsides and waste ground, sandy or muddy soils. Often in disturbed places. Grassland, open woodland, along watercourses, disturbed places, common in shade. Albany Thicket. In grasslands, floodplains, edges of swamps, riverbanks, roadsides and waste grounds, mainly on sandy or muddy soils; up to 1300 m. [e-Flora of South Africa]

curassavicum

PoWo (species): much of the Americas, globally widely introduced

4 vars of which **var. curassavicum** is the main introduced, and **var. oculatum** introduced Far East, **var. obovatum** being just N. America (large area), **var. fruticosum** being just Argentina Northwest

Flora of Turkey 1978

14. *H. curassavicum* L., Sp. Pl. 130 (1753). Ic: Coste, Fl. Fr. 2-608, t. 2615 (1903). Figure 11, p 249.

Plant: Subglabrous perennial.

Leaves: oblong-linear, narrow, very dense, margins entire.

Nutlets: 4, free, ventrally angled and often laterally grooved;

anthers: often coherent at first;

loculi and seeds: curved.

Fl.: 5. Alt. nr s.l.

Described from: tropical America

Geo: W. Anatolia B1 Izmir: Cesme, nr s.l.

Note: Widely cultivated in Europe and Asia, and often becoming naturalized.

Iranica 1994

13. *Heliotropium curassavicum* L., Sp. pi. 1: 130. 1753. Lectotype (Iconotype) (Verdcourt 1991: 67): Curaçao, Morris., Pl. Hist. 3: 452, S. 11, t. 31/12. 1699; Typotype: Herb. MORISON (OXF: vidimus foto!). Fig.: Nasir, Fl. Pakistan 191: 22, fig. 6 G-L.

Plant: Halophytic prostrate perennial (rarely annual), glaucous, completely glabrous, stems up to 40 cm long.

Leaves: 1-5 cm long, 0.2-0.8 cm broad, glaucous, ± fleshy, oblong or oblanceolate, obtuse at top, narrowed at base, the entire margin slightly thickened.

Inflorescence: terminal and lateral, with 1-3 branches; cymes up to 10 cm long, densely flowering, appearing biserial when fruiting, bilateral.

Calyx: The sessile calyx persistent after dropping of nutlets;

calyx lobes: 1-1.3 mm long, lanceolate, subacute, nearly free to base.

Corolla: 1-1.5 mm long, tubular, on both sides glabrous; corolla lobes up to 0.5 mm broad, oblong to rounded.

Anthers: 0.6-1 mm long, acute, inserted 0.5-0.7 mm above corolla base.

Stigma: ca. 0.5 mm long, shortly conical, glabrous.

Style: inconspicuous.

Nutlets: ca. 2 mm long, glabrous, ± rugose, with few ribs in dorsal side.

General distribution: Originally a probable native of America, but introduced or adventive in all continents.

Note: *H. curassavicum* is the only completely glabrous species and by that way easily to recognize. It is one of the few cosmopolitans in *Heliotropium* with distribution range from N & S America over Africa, sometimes introduced to Europe, Asia and Australia. Compared with this enormous area the variability of the species is relatively poor. The preferred habitats are coastal areas and sometimes weedy places. For Flora Iranica Area it is only known from extreme southeastern part of Pakistan. It is more likely that the species might be found under similar conditions in south of Iran.

Flora Iberica 2012

3. *H. curassavicum* L., Sp. Pl.: 130 (1753) [*curassávicum*] Type locality: "Habitat in Americae calidioris maritimis" [iconotype designated by B. Verdcourt in Turrill & Milne-Redh. (eds.), Fl. Trop. E. Afr. Boraginaceae: 67 (1991): Morison, Pl. Hist. Univ. 3: 452, s. 11, T. 31, f. 12 (1699)] Illus.: Valdés, Talavera & Galiano (eds.), Fl. Andalucía Occid. 2: 377 (1987); pl. 124

Plant: Herb to 70 cm, perennial, glabrous, glaucous.

Stems: decumbent, branched.

Leaves: alternate, shortly petiolate; petiole to 1 cm; blade to 4.5 × 0.8 cm, oblanceolate to linear, cuneate, acute to subobtuse, ± fleshy.

Inflorescence: with cymes generally solitary, dense, to 5 cm in flower, to 8 cm in fruit.

Flowers: ebracteate, sessile.

Calyx: divided almost to the base, persistent until after fruit fall, in flower 0.9-1.5(1.6) mm, in fruit to 2 mm, campanulate, glabrous; **lobes** narrowly ovate or oblong to narrowly triangular,

subacute.

Corolla: rotate, 1.5-2(2.5) mm in diameter, glabrous; **tube** 0.5-1.3(1.5) mm, generally shorter than the calyx;

lobes: 0.5-0.9(1) × 0.5-0.8 mm, suborbicular to obovate, without folds between the lobes.

Stamens: inserted towards the base of the corolla tube;

anthers: 0.4-0.6(0.8) mm, almost conical, acute, brownish-yellow.

Ovary: with **style** very short, almost imperceptible; **stigma** discoid, surrounding the apex of the ovary, prolonged into a sterile appendage of 0.5-0.7 mm, conical and glabrous.

Fruit: 4-lobed, generally with 4 nutlets.

Nutlets: 1.7-2.3 × 1-1.8 mm, ovoid, subtrigonal, with the back convex, rugulose-alveolate, with longitudinal ribs - sometimes discontinuous - glabrous, greyish or somewhat yellowish.

2n: = 26, 28*, 52*; n = 13, 12*, 26*.

Hab/Fl.: Salt marshes ± nitrified; 0-100 m. IV-XII.

Geo: Native to America, now naturalized in Macaronesia and almost the entire Mediterranean basin. S and E Iberian Peninsula and Balearic Islands. Spain: [A] [Al] [B] [Ca] [Cs] [(Ge)] [H] [Ma] [Mu] [PM] [T] [V]. Portugal: [Ag]. Vernacular names: heliotropo; Portuguese: tornassol-sem-pélos, verrucária-sem-pélos; Catalan: alacranera de platja (Valencia), cua d'escorpi.

(Claude 2025.12.31)

3. *H. curassavicum* L., Sp. Pl.: 130 (1753) [*curassávicum*] Ind. loc.: "Habitat in Americae calidioris maritimis" [iconotipo designado por B. Verdcourt in Turill & Milne-Redh. (eds.), Fl. Trop. E. Afr. Boraginaceae: 67 (1991); Morison, Pl. Hist. Univ. 3: 452, s. 11, T. 31, f. 12 (1699)] Ic.: Valdés, Talavera & Galiano (eds.), Fl. Andalucía Occid. 2: 377 (1987); lám. 124 - Hierba hasta de 70 cm, perenne, glabra, glauca. Tallos decumbentes, ramificados. Hojas alternas, cortamente pecioladas; peciolo hasta de 1 cm; limbo hasta de 4,5 × 0,8 cm, de oblanceolado a linear, cuneado, de agudo a subobtusado, ± carnosos. Inflorescencia con cimas generalmente solitarias, densas, hasta de 5 cm en la floración, hasta de 8 cm en la fructificación. Flores ebracteadas, sésiles. Cáliz dividido casi hasta la base, persistente hasta después de la caída del fruto, en flor de 0,9-1,5(1,6) mm, en fruto hasta de 2 mm, campanulado, glabro; lóbulos de estrechamente ovados u oblongos a estrechamente triangulares, subagudos. Corola rotácea, de 1,5-2(2,5) mm de diámetro, glabra; tubo 0,5-1,3(1,5) mm, generalmente más corto que el cáliz; lóbulos 0,5-0,9(1) × 0,5-0,8 mm, de suborbiculares a obovados, sin pliegues entre los lóbulos. Estambres insertos hacia la base del tubo de la corola; anteras 0,4-0,6(0,8) mm, casi cónicas, agudas, pardo-amarillentas. Ovario con estilo muy corto, casi imperceptible; estigma discoide, rodeando al ápice del ovario, prolongado en un apéndice estéril de 0,5-0,7 mm, cónico y glabro. Fruto tetralobado, generalmente con 4 núculas. Núculas 1,7-2,3 × 1-1,8 mm, ovoides, subtrigonas, con el dorso convexo, rugulado-alveolado, con costillas -a veces discontinuas- longitudinales, glabras, grisáceas o algo amarillentas. 2n = 26, 28*, 52*; n = 13, 12*, 26*. Saladares ± nitrificados; 0-100 m. IV-XII. Originaria de América se encuentra naturalizada en Macaronesia y en casi toda la cuenca mediterránea. S y E de la Península Ibérica e Islas Baleares. Esp.: [A] [Al] [B] [Ca] [Cs] [(Ge)] [H] [Ma] [Mu] [PM] [T] [V]. Port.: [Ag]. N.v.: heliotropo; port.: tornassol-sem-pélos, verrucária-sem-pélos; cat.: alacranera de platja (Valencia), cua d'escorpi.

Malesiana 1997

Heliotropium curassavicum L., Sp. Pl. (1753) 130; C.B. Rob., Philipp. J. Sc., Bot. 4 (1909) 695; Backer & Bakh. f., Fl. Java 2 (1965) 461. - Type: Herb. Cliff. 45 (BM), 'Habitat in Americae calidioris maritimis'.

Plant: Annual, prostrate to ascending, more or less succulent herb.

Stems: much branched, 5-50 cm or more long, glabrous.

Leaves: shortly stalked to sessile, oblong, spatulate, lanceolate to linear, glaucous, 1-5 by 0.3-1 cm, glabrous.

Cymes: spike-like, 3-10 cm long, dense, ebracteate, usually forked once.

Calyx: subsessile, short, cleft to the base into 5 linear, acute **lobes**, glabrous.

Corolla: 1-2.5(-3) mm long, white or bluish with a yellow centre, **tube** broadening towards base, longer or equalling the calyx, **lobes** 5, rounded.

Stamens: **anthers** subsessile, sagittate, mucronate at apex.

Pistil: **style** indistinct, **stigma** 0.2 mm long, with a broad, discoid base.

Fruit: breaking up into 4 **nutlets**;

nutlets: 1.6-1.8 mm long, wedge-shaped, smooth at first, later sometimes rugulose, glabrous.

Distribution: A native of the Americas from Patagonia to the United States and the West Indies; Malesia: occasionally occurring as a weed in widely different places such as Java (near Bogor) and the Philippines.

Habitat: In its native countries in wet places, along the sea shore, etc.

Argentina 2016

1. Fruit slightly wider than tall, subglobose; nutlet with thick mesocarp, surface matte, smooth or irregularly rugose-striate, whitish, ventral foveola with non-auriculate margin. Length of corolla tube $\pm 1/2$ the length of the corolla. -- 6. H. **curassavicum**

2. Flower 1.5-2.5 mm long. Anthers cordiform, almost as wide as long. Procumbent plants less than 10 cm tall. -- 6a. H. **curassavicum** var. **curassavicum**

2'. Flower ± 3.5 mm long. Anthers narrowly ovate, 2-3 times longer than wide. Decumbent plants ± 20 cm tall. -- 6b. H. **curassavicum** var. **argentinum**

1'. Fruit slightly taller than wide, ovate; nutlet with thin mesocarp, surface shiny, uniformly granulose, light brown to brownish, ventral foveola with apically auriculate margin. Length of corolla tube $\pm 2/3$ the length of the corolla. Flower 3-5 mm long.

3. Herbaceous plants, prostrate, glaucous. Leaves with undulate-crisped margin. Stigmatic column 1-2 mm long. -- 13. H. **johnstonii**

3'. Woody plants, erect, not glaucous. Leaves with smooth margin. Stigmatic column 0.5-1 mm long. -- 6c. H. **curassavicum** var. **fruticulosum**

Heliotropium curassavicum L., Sp. pl. 1: 130. 1753.

6a. *Heliotropium curassavicum* var. **curassavicum**

Procumbent plants usually less than 5 cm tall and 8-30 cm long.

Leaves small, somewhat fleshy, glaucous, 5-15 x 1-3 mm closely arranged on lateral branches or 20-30 x 5-8 mm those alternating on primary axes, **petiole** 2-3 (10) mm long.

Scorpioid cymes commonly sessile, simple, some double, dense and short, 2-4 cm long and 12-25 flowers;

calyx 1-1.5 mm long, lobes ovate, obtuse, ± 2 times longer than wide;

corolla 1.5-2 mm long;

anthers cordate, 0.5-0.8 mm long, thecae deeply separated at base;

gynoecium 0.7-1 mm long,

stigma generally shorter than **ovary**.

Fruit 17.5 [sic: 1.75] x 2 mm;

seed ± 1.5 x 0.6 mm;

embryo ± 1 x 0.3 mm.

Distribution and habitat: Cosmopolitan variety, widely distributed in the American continent between southern U.S.A. and Patagonia. It has become naturalized in some countries of southern Europe and Asia, having also spread to Africa and Australia. It inhabits a large part of Argentine territory, growing in saline and moist soils. In Chile it is a common weed in alfalfa fields and natural grasslands (O. Matthei, 1995).

6b. *Heliotropium curassavicum* var. *argentinum* I. M. Johnst., Contr. Gray Herb. 81: 15. 1928 (Fig. 3). **Plants** up to 20 cm tall; stems decumbent, 15-50 cm long; **leaves** frequently narrow, 15-60 x 1-4 mm, sometimes broader, 5-15 mm. **Scorpioid cymes** preferentially double, 10-15 cm long and 30-60 **flowers**, exceptionally up to 45 cm long and about 170 flowers; **calyx** ± 2 mm long, **lobes** narrowly ovate or triangular, nearly 3 times longer than wide; **corolla** 3-5 mm long; **anthers** 1-1.5 mm long; **gynoecium** ± 1.5 mm long, **stigma** of similar length or longer than **ovary**. **Fruit** ± 2 x 2.5 mm; **seed** ± 1.75 x 1; **embryo** ± 1.5 x 0.5 mm. n = 13 (Di Fulvio, Kurtziana 5: 90. 1969) and n = 14 (Schnack & Covas, Haumania 1, 1: 36. 1947). **Distribution and habitat:** Forms part of the halophytic flora of nearly all Argentine provinces from the northern border of the country to Rio Negro as well as neighboring countries. It prefers clayey, saline, and floodable soils.

6c. *Heliotropium curassavicum* var. *fruticulosum* I. M. Johnst., Wrightia 2 (1): 15. 1959. (Argentina. Prov. San Juan: Dept. Caligasta, between Tamberías and Calingasta, Ruiz Leal 16314, 21-IX-1958. Isotype: CORD 00003784. Prov. Mendoza. Dept. Laval: Laguna del Rosario, Capilla, Ruiz Leal 14536, 8-I-1952. Isotype: CORD 00003782. Prov. San Juan. Dept. Angaco Norte, on the margins of the San Juan River, Ruiz Leal 16347, 29-X-1954. Isotype: CORD 00003781). **Suffrutescent** plants generally erect, up to 35 cm tall; **roots and basal stem** collar lignified. **Leaves** linear-spatulate, 15-30 x 1-3 mm and oblanceolate up to 40 x 7 mm, glaucous, generally subtending lateral branches. **Scorpioid cymes** simple, rarely double, up to 10 cm long and ± 40. **Flowers** usually subpedicellate and somewhat distant from each other; **calyx** 3-4.5 mm long; **corolla** 3-5 mm long, tube with 5 groups of druses in the petalostemons; **anthers** 1.5-2 mm long; **gynoecium** 1-1.5 mm long, **stigma** higher than ovary, **stigmatic** column 0.7-1 mm long, **ovary** 0.3-0.5 mm long. **Fruit** 2-2.5 x 1.8-2 mm; **seed** ± 2.3 x 1 mm; **embryo** ± 2 x 0.4 mm. n = 13; 26 (the latter number sub nom. *H. curassavicum* var. *argentinum*, Di Fulvio, Kurtziana 5: 90. 1969). **Distribution and habitat:** Endemic, frequent in sandy areas of mountainous regions (450-2500 m a.s.l.) of western Argentina.

1. Fruto poco más ancho que alto, subgloboso; clusa con mesocarpo grueso, superficie mate, lisa o irregularmente rugoso-estriada, blanquecina, foveola ventral con reborde no auriculado. Longitud del tubo corolino ± 1/2 la longitud de la corola. -- 6. *H. curassavicum*

2. Flor de 1,5-2,5 mm de long. Anteras cordiformes, casi tan anchas como largas. Plantas procumbentes menores de 10 cm de alto. -- 6a. *H. curassavicum* var. *curassavicum*

2'. Flor de ± 3,5 mm de long. Anteras angostamente ovadas, 2-3 veces más largas que anchas. Plantas decumbentes de ± 20 cm de alto. -- 6b. *H. curassavicum* var. *argentinum*

1'. Fruto poco más alto que ancho, ovado; clusa con mesocarpo delgado, superficie brillante, uniformemente granulosa, marrón claro a parduzco, foveola ventral con reborde apicalmente auriculado. Longitud del tubo corolino ± 2/3 la longitud de la corola. Flor de 3-5 mm de long.

3. Plantas herbáceas, postradas, glaucas. Hojas de borde ondulado-encrepado. Columna estigmática de 1-2 mm de long. -- 13. *H. johnstonii*

3'. Plantas leñosas, erguidas, no glaucas. Hojas de borde liso. Columna estigmática de 0,5-1 mm de long. -- 6c. *H. curassavicum* var. *fruticulosum*

6. *Heliotropium curassavicum* L., Sp. pl. 1: 130. 1753.

6a. *Heliotropium curassavicum* var. *curassavicum* Plantas procumbentes usualmente menores a 5 cm de alto y de 8-30 cm de long. Hojas pequeñas algo carnosas, glaucas, de 5-15 x 1-3 mm apretadamente dispuestas en ramitas laterales o de 20-30 x 5-8 mm las que alternan en ejes primarios, peciolo 2-3 (10) mm de long. Cincinos comúnmente sésiles, simples, algunos dobles, densos y cortos de 2-4 cm de long. y 12-25 flores; cáliz de 1-1,5 mm de long., lacinias ovadas, obtusas, ± 2 veces más largas que anchas; corola de 1,5-2 mm de long.; anteras cordiformes de 0,5-0,8 mm de long., tecas profundamente separadas en la base; gineceo de 0,7-1 mm de long., estigma generalmente menor que el ovario. Fruto de 17,5 x 2 mm; semilla de ± 1,5 x 0,6 mm; embrión de ± 1 x 0,3 mm. Distribución y hábitat: Variedad cosmopolita, de amplia distribución en el continente americano entre el sur de U.S.A. y la Patagonia. Se ha naturalizado en algunos países del sur de Europa y

Asia, habiéndose difundido también en África y Australia. Habita en gran parte del territorio argentino, creciendo en terrenos salitrosos y húmedos. En Chile es maleza común en alfalfares y praderas naturales (O. Matthei, 1995).

6b. *Heliotropium curassavicum* var. *argentinum* I. M. Johnst., Contr. Gray Herb. 81: 15. 1928 (Fig. 3). Plantas de hasta 20 cm de alto; tallos decumbentes de 15-50 cm de long.; hojas con frecuencia angostas, de 15-60 x 1-4 mm, a veces más anchas de 5-15 mm. Cincinos preferentemente dobles, de 10-15 cm de long. y 30-60 flores, excepcionalmente, hasta 45 cm de long. y unas 170 flores; cáliz de ± 2 mm de long., lacinias estrechamente ovadas o triangulares casi 3 veces más largas que anchas; corola de 3-5 mm de long.; anteras de 1-1,5 mm de long.; gineceo de $\pm 1,5$ mm de long., estigma de longitud similar o mayor al ovario. Fruto de $\pm 2 \times 2,5$ mm; semilla de $\pm 1,75 \times 1$; embrión de $\pm 1,5 \times 0,5$ mm. n = 13 (Di Fulvio, Kurtziana 5: 90. 1969) y n = 14 (Schnack & Covas, Haumania 1, 1: 36. 1947). Distribución y hábitat: Integra la flora halófila de casi todas las provincias argentinas desde el límite norte del país hasta Río Negro así como de los países lindantes. Prefiere suelos arcillosos, salinos e inundables.

6c. *Heliotropium curassavicum* var. *fruticulosum* I. M. Johnst., Wrightia 2 (1): 15. 1959. (Argentina. Prov. San Juan: Dpto. Caligasta, entre Tamberías y Caligasta, Ruiz Leal 16314, 21-IX-1958. Isoparatipo: CORD 00003784. Prov. Mendoza. Dpto. Laval: Laguna del Rosario, Capilla, Ruiz Leal 14536, 8-I-1952. Isoparatipo: CORD 00003782. Prov. San Juan. Dpto. Angaco Norte, en las márgenes del río San Juan, Ruiz Leal 16347, 29-X-1954. Isoparatipo: CORD 00003781). Plantas sufruticosas generalmente erectas, de hasta 35 cm de altura; raíces y cuello basal de tallos lignificados. Hojas linear-espatuladas de 15-30 x 1-3 mm y oblanceoladas de hasta 40 x 7 mm, glaucas, generalmente axilantes de ramas laterales. Cincinos simples, raros dobles de hasta 10 cm de long. y ± 40 . Flores usualmente subpediceladas y algo distantes entre sí; cáliz de 3-4,5 mm de long.; corola de 3-5 mm de long., tubo con 5 grupos de drusas en el petalostemo; anteras de 1,5-2 mm de long.; gineceo de 1-1,5 mm de long., estigma más alto que el ovario, columna estigmática de 0,7-1 mm de long., ovario de 0,3-0,5 mm de long. Fruto de 2-2,5 x 1,8-2 mm; semilla de $\pm 2,3 \times 1$ mm; embrión de $\pm 2 \times 0,4$ mm. n = 13; 26 (este último número sub nom. *H. curassavicum* var. *argentinum*, Di Fulvio, Kurtziana 5: 90. 1969). Distribución y hábitat: Endemismo frecuente en arenales de regiones montañosas (450-2500 m.s.m.) del oeste argentino.

Flora Argentina

Heliotropium curassavicum var. *curassavicum*

<https://buscador.floraargentina.edu.ar/species/details/7221>

Plant: Perennial herb to 45 cm tall; **stems** erect, decumbent, or procumbent, glabrous.

Leaves: alternate, sessile; **blades** linear or narrowly elliptic, 0.5-4(-8) x 0.1-1(-1.5) cm, glabrous, subfleshy, **apex** obtuse, base obtuse, **margin** entire or slightly crenulate.

Inflorescences: in cincinni 8-10(-20) cm long, pedunculate, simple, multiflowered, with ca. 50 flowers.

Flowers: with calyx 2-3 mm long, lobes ovate, acute, glabrous;

corolla: funnelform white or cream, tube 2-4 mm long, externally and internally glabrous, limb 3 mm in diameter;

anthers: narrowly ovate, acuminate, ca. 1.5 mm long;

ovary: 0.5 mm long, stigma with cylindrical column and irregularly lobed at apex, 1-2 mm long.

Fruit: 1.5-2 x 1 mm, glabrous, divided into 4 1-seeded mericarps, back granulose.

Var. curassavicum: Plants with decumbent or procumbent stems

Claude 2025.12.31

Hierba perenne hasta de 45 cm de alto; tallos erectos, decumbentes, o procumbentes, glabros. Hojas alternas, sésiles; láminas lineares o angostamente elípticas, de 0,5-4(-8) x 0,1-1(-1,5) cm, glabras, subcarnosas, ápice obtuso, base obtusa, el margen liso o ligeramente crenulado. Inflorescencias en cincinos de 8-10(-20) cm de largo, pedunculados, simples, multifloros, con ca. 50 flores. Flores con el cáliz de 2-3 mm de largo, lacinias ovadas, agudas, glabras; corola infundibuliforme blanca o crema, tubo de 2-4 mm de largo, exterior e interiormente glabra, limbo de 3 mm de diámetro; anteras angostamente ovadas, acuminadas, ca. 1,5 mm de largo; ovario de 0,5 mm de largo, estigma con columna cilíndrica e irregularmente lobada en el ápice, de 1-2 mm de largo. Fruto de 1,5-2 x 1 mm, glabro, dividido en 4 clusas 1-seminadas, dorso granuloso. Var. *curassavicum*.- Plantas con tallos decumbentes o procumbentes

Heliotropium curassavicum var. *fruticulosum*

<https://buscador.floraargentina.edu.ar/species/details/7222>

Perennial herb to 45 cm tall; **stems** erect, decumbent, or procumbent, glabrous. **Leaves** alternate, sessile; **blades** linear or narrowly elliptic, 0.5-4(-8) x 0.1-1(-1.5) cm, glabrous, subfleshy, **apex** obtuse, base obtuse, **margin** entire or slightly crenulate. **Inflorescences** in cincinni 8-10(-20) cm

long, pedunculate, simple, multiflowered, with ca. 50 flowers. **Flowers** with **calyx** 2-3 mm long, lobes ovate, acute, glabrous; **corolla** funnelform white or cream, **tube** 2-4 mm long, externally and internally glabrous, **limb** 3 mm in diameter; **anthers** narrowly ovate, acuminate, ca. 1.5 mm long; **ovary** 0.5 mm long, **stigma** with cylindrical column and irregularly lobed at apex, 1-2 mm long. **Fruit** 1.5-2 x 1 mm, glabrous, divided into 4 1-seeded **mericarps**, back granulose. **Var. fruticosum**.- Plants with erect stems.

Claude 2025.12.31

Hierba perenne hasta de 45 cm de alto; tallos erectos, decumbentes, o procumbentes, glabros. Hojas alternas, sésiles; láminas lineares o angostamente elípticas, de 0,5-4(-8) x 0,1-1(-1,5) cm, glabras, subcarnosas, ápice obtuso, base obtusa, el margen liso o ligeramente crenulado. Inflorescencias en cincinnos de 8-10(-20) cm de largo, pedunculados, simples, multifloros, con ca. 50 flores. Flores con el cáliz de 2-3 mm de largo, lacinias ovadas, agudas, glabras; corola infundibuliforme blanca o crema, tubo de 2-4 mm de largo, exterior e interiormente glabra, limbo de 3 mm de diámetro; anteras angostamente ovadas, acuminadas, ca. 1,5 mm de largo; ovario de 0,5 mm de largo, estigma con columna cilíndrica e irregularmente lobada en el ápice, de 1-2 mm de largo. Fruto de 1,5-2 x 1 mm, glabro, dividido en 4 clusas 1-seminadas, dorso granuloso. Var. fruticosum.- Plantas con tallos erectos.

Flora Europaea 1972

10. *H. curassavicum* L., Sp. Pl. 130 (1753).

Plant: Perennial, glabrous and rather glaucous and fleshy throughout;

stems: up to 70 cm, procumbent.

Leaves: up to 4 x 1 cm, spatulate to linear-oblong; lateral **veins** scarcely visible.

Sepals: 1-2 mm, ovate.

Corolla: 1-2.5 mm; limb c. 2 mm in diameter, white.

Stigma: shortly conical.

Fruit: splitting into 4 nutlets, glabrous.

Hab: Sandy saline places near the sea.

Geo: Naturalized in S. Europe. [Az BI Ga Hs Lu Rm Sa Si.] (North and South America.)

Capensis 1904

1. *H. curassavicum* (Linn. Sp. Pl. ed. i. 130)

rootstock: woody;

stem: woody; **branched** from the base, up to 10 in. high, glabrous;

leaves: oblong, obtuse, tapering downwards into a short petiole, up to 1 in. by 3 lin., glabrous, slightly verrucose;

cymes: often branched, up to 1.5 in. long;

peduncle: up to 9 lin. long;

calyx: quite glabrous, irregular; **lobes** linear or triangular, obtuse;

corolla: slightly exserted from the calyx;

lobes: ovate-triangular, **one** much larger than the rest [!not apparent in photos];

stamens: inserted about the middle of the corolla-tube;

anthers: ovoid, acute;

nutlets: with two small flat and one very large convex side, slightly rugose on the back.

Drége, Zwei Pflanzengeogr. Documente, 63, 130; DC. Prod. ix. 538.

Var. B, virens (DC. Prod. ix. 538); more robust than the type; **leaves** up to 1.5 in. by 4 lin. H. virens, E. Meyer ex DC. Prod, ix. 538.

myosotoides

PoWo Banks & Sol.: Iraq, Lebanon-Syria, Palestine, Türkiye

- Not **Lehm.** > *Euploca strigosa* - most of Africa (only Algeria on N edge), S. Arabian peninsula, Afghanistan & eastwards - Afghanistan, Algeria, Angola, Assam, Bangladesh, Benin, Botswana, Burkina, Cambodia, Cameroon, Chad, China Southeast, Djibouti, DR Congo, East Himalaya, Eritrea, Eswatini, Ethiopia, Gambia, Ghana, Guinea, Guinea-Bissau, Gulf States, India, Ivory Coast, Kenya, KwaZulu-Natal, Laos, Malawi, Mali, Mauritania, Mozambique, Myanmar, Namibia, Nepal, Niger, Nigeria, Northern Provinces, Oman, Pakistan, Philippines, Rwanda, Saudi Arabia, Senegal, Socotra, Somalia, Sri Lanka, Sudan-South Sudan, Tanzania, Thailand, Togo, Uganda, Vietnam, West Himalaya, Yemen, Zambia, Zimbabwe
- Not **Chapm.** > *Euploca fruticosa* (L.) J.I.M.Melo & Semir - Americas (either side of Meso)

Flora of Turkey 1978

6. *H. myosotoides* Banks & Sol in Russell, Aleppo ed. 2, 2.245 (1794). Syn: *H. aleppicum* Boiss. Diagn ser 1(11) 88 (1849). Figure 11, p. 249.

Plant: Annual, strigulose-tomentose with rather stiff patent dense hairs on small tubercles.

Stem: erect, much-branched.

Leaves: 18-27 mm, ovate-lanceolate, acute, **lowest** shortly petiolate, **upper** sessile.

Inflorescence: lax, **bracteate** near base.

Calyx: c. 2mm, pedicellate.

Corolla: to 2.5 mm, subcylindrical, hirsute, with short erect lobes and small **intercalary** teeth.

Stigma: subsessile, subulate from a disc-like base, penicillate at tip.

Nutlets: with small warts and pits, hispidulous or glabrous.

Hab: Limestone rocks, c. 100 m.

Described from: Aleppo, N. Syria.

Syria-Palestine Post 1933

Key Section: **Annuals** - **Corolla-lobes** imbricated in bud - **Calyx** persistent after the shedding of the fruit. **Nutlets** 4. - **Stigma** tapering from a conical base.

2. *H. aleppicum* Boiss. (1849) © [Annual] Aleppo T. (iv. 129).

Plant: 30 to 40 cm, strigose-woolly, dichotomously branching from base.

Leaves: oblong, to oblong linear, 1 to 3 cm long, 6 to 8 mm wide, acute, tapering at base, the lower short-petioled.

Racemes: rather loose, **bracteate** below; **flowers** minute;

calyx-lobes: erect, persistent;

corolla: 2 mm long, hirsute without, glabrous within;

stigma: nearly sessile, subulate above, penicillate at apex;

nutlets: glabrous.

Flw: May-Sept.

Hab: Fields and plains.

Geo: No. Antioch to Aleppo (Bo), Aintab (P), Hamah; Leb. near Tripoli (Bl. in PH), near Sidon (G. in Bo); Pal. 'Ayn-Arrub, Jaffa (D).

Boissier 1849

Heliotropium Aleppicum Boiss. (Sect. *Euheliotropium*.)

Annual heliotrope, entire plant densely covered with short white **bristles** that are strigose and arise from **tuberculate** bases, giving it a greyish-white appearance; **stem** erect, dwarf, branched from the base with rather strict branches; **leaves** oblong or oblong-linear, somewhat acute, attenuated at both ends, shortly petiolate, **upper** surface greener and less setose, **lower** surface often prominently nerved; **spikes** short, loosely flowered, terminal, **bracteate** towards the base; **calyx** divisions triangular-lanceolate, somewhat acute; **corolla** small, nearly tubular, silky on the outside, glabrous within, **tube** scarcely longer than the calyx, **limb** very small, with quincuncial **aestivation**, **lobes** somewhat crenate-denticulate, rounded; **anthers** inserted a little above the base of the corolla, **apex** shortly mucronate; **style** absent; **stigma** cylindric-subulate from a somewhat dilated base, **apex** white-penicillate, otherwise glabrous; **nutlets** very small, ovate, tuberculate, glabrous, slightly exceeded by the calyx.

Habitat: On the elevated plain situated between the coast of Syria and the city of Aleppo, where I collected it in June 1846.

Plant 3-5 inches [8.1-13.5 cm] tall; leaves an inch and more long, 3-4 lines [6.8-9.0 mm] wide; **flowers** scarcely larger than those of *H. supinum*. The species is most distinct by its **indumentum**, strict **habit**, and spikes **bracteate** at the base.

[Claude 2026.01.08]

H. annuum totum setis albis brevibus basi tuberculis densè strigulosum cano-griseum, caule erecto pumilo a basi ramoso ramis strictiusculis, foliis oblongis vel oblongo-linearibus acutiusculis utrinquè attenuatis breviter petiolatis facie superiori viridioribus minùs setosis inferiori sæpè prominenter nervosis, spicis brevibus laxifloris terminalibus infernè bracteatis, calycis partitionibus triangulari-lanceolatis acutiusculis, corollæ parvæ ferè tubulosæ extùs sericeæ intùs glabræ tubo calyce vix longiori limbo minimo æstivatione quincunciali lobis subcrenato-denticulatis rotundatis, antheris paulò suprà basin corollæ insertis apice breviter mucronatis, stylo nullo, stigmate e basi subdilatatâ cylindrico-subulato apice albo-penicillato cæterùm glabro, nuculis minimis ovatis tuberculatis glabris calyce paulò superatis. Hab. in planitie elatâ inter littora Syriæ et urbem Aleppum sitâ ubi legi Jun. 1846. Planta 3-5 pollicaris, folia pollicem et ampliùs longa 3-4 lin. lata, flores eis *H. supini* vix majores. Species indumento, habitu stricto, spicis basi bracteatis distinctissima.

Transcribed: Gemini then compared to scan

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